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TWENTY-SEVENTH BIENNIAL REPORT
OF THE
NORTH CAROLINA
STATE BOARD OF HEALTH

JULY 1, 1936—JUNE 30, 1938

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OF THE

NORTH CAROLINA
STATE BOARD OF HEALTH



JULY 1, 1936---JUNE 30, 1938

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Term expires 1941

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Term expires 1939

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Term expires 1941



LETTER OF TRANSMITTAL

Raleigh, N. C., September 21, 1938

His Excellency, CLYDE R. HOEY,
Governor of North Carolina

MY DEAR SIR:—Under Authority of Chapter 118, Article 1, Section 7050, Consolidated Statutes of North Carolina, I have to submit to you for transmission to the General Assembly the Biennial Report of the State Board of Health for the period July 1, 1936 to June 30, 1938.

Yours sincerely,
CARL V. REYNOLDS,
Secretary and State Health Officer.

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THE CHRONOLOGICAL DEVELOPMENT OF PUBLIC HEALTH WORK IN NORTH CAROLINA

In the seventies Dr. Thomas Fanning Wood, of Wilmington, caught the vision of the possibilities of public health work to North Carolina. How fully he grasped the far-reaching consequences of his idea, how clearly he saw the ever-growing hosts of lives saved as a result of his vision and inspiration, we shall never know. We do know that the vision never left him, and that under its sway he worked, through the Medical Journal which he edited and through the North Carolina State Medical Society until his influence reached the people of the State in their General Assembly of 1877, with the effect that on February 12, 1877, the North Carolina State Board of Health was born. Ours was the twelfth State board of health to be established.

Without treating the development of the newly-established board with that thoroughness that could be termed history, we think it enough to set down here in chronological order the principal events in the life and growth of the North Carolina State Board of Health.

1877. Board created by the General Assembly. Consisted in the beginning of entire State Medical Society. Society acted through a committee. Annual appropriation, \$100.
1878. First educational pamphlet issued. Subject, "Timely Aid for the Drowned and Suffocated." Annual appropriation, \$100.
1879. The General Assembly reconstituted the Board of Health. Made it to consist of nine members: six appointed by the Governor, three elected by the State Medical Society. Term of office, five years. Dr. Thomas F. Wood elected first Secretary of the Board, May 21. Dr. S. S. Satchwell was first President of the Board. Other legislative provisions: (1) Chemical examination of water, and (2) organization of county boards of health, composed of all regular practicing physicians and, in addition, the mayor of the county town, the chairman of the board of county commissioners, and the county surveyor. Four educational pamphlets issued. Subjects: "Disinfection, Drainage, Drinking Water, and Disinfectants;" "Sanitary Engineering;" "Methods of Performing Post-mortem Examinations;" "Limitation and Prevention of Diphtheria." Annual appropriation, \$200.
1881. General Assembly passed a law requiring regulation of vital statistics at annual tax listing; law ineffective. Annual appropriation, \$200.
1885. General Assembly made county boards of health more efficient; allowed printing privileges not to exceed \$250 annually. Annual appropriation, \$2,000.
1886. The Health Bulletin made its appearance in April. Pamphlet on "Care Eyes and Ears," by Dr. Richard H. Lewis, printed and distributed.

1888. Yellow fever epidemic in Florida and refugees to Western North Carolina demonstrated value of a Board of Health to cope with situation. Annual appropriation, \$2,000.
1892. Dr. Thomas F. Wood, the Secretary of the Board, died August 22. Dr. Richard H. Lewis elected Secretary to succeed Dr. Thomas F. Wood, September 7. Annual appropriation, \$2,000.
1893. Legislative provisions: (1) Laws improving the reporting of contagious diseases, (2) the protection of school children from epidemics, (3) protecting the purity of public water supplies, and (4) regulation of common carriers. Legislature provided that Governor appoint five of the nine members of the Board of Health, that the State Medical Society elect four, and that the term of office of the members of the State Board of Health be from five to six years. The \$250 printing limit was removed. Pamphlet on quarantine and disinfection was prepared and reprinted by many of the State papers. Annual appropriation, \$2,000.
1894. A number of public health conferences were arranged and held in different towns of the State. Bulletin was increased from a mailing list of 800 to 1,200. Annual appropriation, \$2,000.
1895. Dr. Albert Anderson and Dr. W. T. Pate were elected bacteriologists for the board. Annual appropriation, \$2,000.
1896. Board passed a resolution requiring chemical and bacteriological examinations of municipal water supplies. Dr. Venable, of Chapel Hill, undertook the chemical examination, and Drs. Anderson and Pate the bacteriological examination. Board also directed Mr. John C. Chase, the engineer member, to inspect all municipal water plants in the State. Annual appropriation, \$2,000.
1897. General Assembly enacted law requiring county superintendents of health to be elected by county commissioners and reduced term of office to one year. Annual appropriation \$2,000.
1899. General Assembly improved the laws protecting public water supplies. Smallpox prevailed extensively in the State. Dr. Henry F. Long, and later, on Dr. Long's resignation, Dr. Joshua Tayloe, were employed to travel over the State, consulting with and advising the local sanitary authorities as to proper means for protecting the public. Annual appropriation \$2,000.
1900. State Board of Agriculture, on request of State Board of Health, agreed to examine samples of water from public water supplies until Board of Health could provide its own examiner. Annual appropriation, \$2,000.
1901. State Board of Embalmers, with representatives of State Board of Health, established. County health work placed in the hands of county sanitary committees composed of county commissioners and two physicians which commissioners elected to

serve with them. Term of office of county superintendent of health made two years. Annual appropriation, \$2,000.

1903. General Assembly enacted law permitting Board of Health to charge \$5 for each analysis of a public water supply, this fee to be used in paying Department of Agriculture for services of examiner. Dr. C. W. Stiles, U. S. P. H. S., before the State Medical Society at Hot Springs, called attention to prevalence of hookworm disease in the South. Dr. J. L. Nicholson and Dr. W. S. Rankin, working under State Board of Health during fall of 1903 and spring of 1904, showed great prevalence of this disease in North Carolina. Annual appropriation, \$2,000.
1904. A stenographer was employed. One hundred and twenty thousand pamphlets on tuberculosis were printed and distributed. There was a renewal and an extension of co-operative work between the Board of Health and the State press, a number of articles dealing with hygienic and sanitary subjects being furnished the papers and published in them. Annual appropriation, \$2,000.
1905. General Assembly established State Laboratory of Hygiene; imposed water tax of \$64 on all public water companies; voted \$600 annually for the support of laboratory. Small appropriation made it necessary for the Department of Agriculture to continue to assist State Board of Health. Annual appropriation, \$2,000.
1906. The North Carolina Association for the Study and Prevention of Tuberculosis was organized. Annual appropriation, \$2,000.
1907. Two thousand dollars appropriated for the State Laboratory of Hygiene. Pasteur treatment provided. State Sanatorium for treatment of tuberculosis founded; \$15,000 appropriated for permanent improvements and \$5,000 for maintenance. A law requiring the separation of tuberculosis prisoners from other prisoners was enacted. Annual appropriation, \$4,000.
1908. January 1, Dr. C. A. Shore became Director of State Laboratory of Hygiene. Annual appropriation, \$4,000.
1909. General Assembly provided for (1) whole-time State Health Officer; (2) collection of vital statistics of towns having a population of 1,000 or over; (3) that all public water companies file plans and specifications of their plants with the State Board of Health, and that the State Board of Health pass necessary rules and regulations for the care of public watersheds and plants and furnish such rules and regulations and other advice to those having charge of public water supplies; (4) that counties provide free diphtheria antitoxin for county indigents, and (5) that the maintenance appropriation for the Sanatorium be increased from \$5,000 to \$7,500, and an additional \$30,000 be granted for permanent improvements. Dr. Richard H. Lewis resigned as Secretary of the Board, and Dr. W. S. Rankin was elected as his successor, beginning his official work July 1. Annual appropriation, \$10,500.

1910. General effort to interest the people and State organizations in public health work. Bulletin increased from 3,500 edition to 10,500 edition. Addresses on public health work delivered to Conference of County Superintendents of Schools, State Federation of Women's Clubs, State Press Association, and Sanitary Sunday observed in April. Dr. John A. Ferrell elected, February, Assistant Secretary for Hookworm Eradication; began work under State Board of Health and Rockefeller Sanitary Commission.
1911. Legislature established county boards of health to take the place of the county sanitary committees; county board of health composed of chairman board of county commissioners; county superintendent of schools, mayor of county town, and two physicians selected by the three county officials to serve with them. Legislature also abolished quarantine for smallpox and improved the quarantine laws. One thousand dollars annually appropriated to contract with antitoxin manufacturers for State supply of high-grade diphtheria antitoxin, with result that price of antitoxin was cut to one-fourth former price, saving the citizens of the State over \$30,000 annually. Bulletin increased from 11,500 copies to 20,000 copies each edition; closer co-operation with press of State developed; regular weekly press articles prepared and sent to papers; increase in numbers of popular pamphlets for distribution. Hookworm work this year largely educational through the school forces and investigative through county dispensaries; thousands of children found infected and treated. Strong sentiment began to make itself felt for better health work by counties, four counties employing whole-time county health officers. Guilford County—one of the four—began its work June 1 and was the first county in the United States to inaugurate full-time county health work. Maintenance appropriation for State Sanatorium increased to \$12,500, with \$20,000 voted for permanent improvements. Annual appropriation \$22,500.
1912. Bulletin increased to 40,000 edition; number of popular pamphlets dealing with different diseases increased; press work improved; educational work of Board along all lines amplified. Secretary of Board of Health called attention of conjoint meeting of State Medical Society and State Board of Health to the relative importance of health problems and the bearing of this subject upon the proper apportionment of health funds; instrumental in passing a resolution to the effect that pellagra was an interstate problem, not a State problem, and requesting the Federal Government to deal with pellagra as a Federal problem; resolution responsible, to considerable extent, for successful effort on part of Hon. John M. Faison's securing Congressional appropriation of \$45,000 for the study of pellagra by the Federal Government. Hookworm work extended and county funds appropriated to supplement State and Rocke-

feller Foundation for this work. Annual appropriation, \$22,500.

1913. General Assembly passed Model Vital Statistics Law with \$10,000 appropriation for its enforcement. County superintendent of health changed to either county physician or county health officer, depending on whether part-time or full-time service. Educational efforts of Board continued and enlarged. Hookworm work along same line as year before increased in amount. Dr. John A. Ferrell resigned as Assistant Secretary to accept position with the central office of the Rockefeller Sanitary Commission in Washington, D. C. Dr. C. L. Pridgen succeeded Dr. Ferrell. The movement for improved county health work had by this time resulted in ten counties electing whole-time county health officers. The State Sanatorium for Treatment of Tuberculosis turned over by Extra Session of 1913 to the management of State Board of Health. Annual appropriation, \$40,500.
1914. Preceding work of the Board continued. Board of Health took over management of Sanatorium; started out under many difficulties on account of the institution owing many debts and the appropriation being limited. Hookworm work changed to community work directed to the installation of sanitary privies in all homes. Laboratory began to produce and distribute free anti-typhoid vaccine. Dr. C. L. Pridgen resigned as Director Hookworm Eradication, and Dr. W. P. Jacocks succeeded him. Annual appropriation, \$40,500.
1915. General Assembly makes State vital statistics law conform to national model by requiring burial permits in rural communities; enacts legislation permitting county commissioners and towns and cities to appropriate money for support of tuberculosis citizens in State Sanatorium; provides \$15,000 for purchase and building of antitoxin plant; appropriates \$60,000 for payment of Sanatorium debts and new buildings and other improvements, and \$25,000 annually for maintenance and \$10,000 for extension anti-tuberculosis work. Educational work greatly extended: Bulletin now 47,000; traveling public health exhibit shown at fairs and other assemblages; press work greatly developed through employment of Miss Kate Herring, a journalist, for her whole time; stock lectures with lantern slides supplied public speakers in different parts of the State; community soil pollution work under Dr. W. P. Jacocks stops in April, and Bureau of Rural Sanitation, with Dr. G. M. Cooper at its head, succeeds, beginning work May 1. Considerable amount of work done for improvement of prison conditions. The unit system of county health work gets a good start; over 52,000 people given three complete vaccinations against typhoid fever, and medical inspection of schools put on in six counties. Annual appropriation, \$50,500.

1916. North Carolina was admitted to the Registration Area for deaths. To the educational agencies of the Board was added a self-supporting moving picture health show. Many saw this show during the year and, seeing, believed in health work as never before. Bulletin reached 51,000 edition. Co-operation with University in developing a plan and putting on a home post-graduate course in medicine, giving first course to 169 doctors. Put into operation an optional system of hotel inspection, with grading and publishing scores. Continued Bureau of Rural Sanitation, giving three anti-typhoid injections to 48,000, making 100,000 immunized in summers of 1915 and 1916. Did complete medical inspection of six counties and with inspection a large amount of educational work as to sanitary and hygienic living. Secured effort by Federal Children's Bureau to develop unit of child hygiene work, the Bureau using two employees to work in Cumberland and Swain counties for about eight months. Laboratory of Hygiene buys land and erects its own building. Annual appropriation, \$55,500.
1917. The General Assembly passed the following important health legislation: Chapter 263, entitled "An act to prevent and control the occurrence of certain infectious diseases in North Carolina"; Chapter 244, entitled "An act to provide for the physical examination of the school children of the State at regular intervals"; Chapter 276, entitled "An act for the co-operative and effective development of rural sanitation"; Chapter 257, entitled "An act to prevent blindness in infancy, designating certain powers and duties and otherwise providing for the enforcement of this act"; Chapter 66, entitled "An act to provide for the sanitary inspection and conduct of hotels and restaurants"; Chapter 286, entitled "An act to regulate the treatment, handling and work of prisoners."

Following the enactment of this legislation, administrative machinery, consisting of a Bureau of Epidemiology under the direction of Dr. A. McR. Crouch, a Bureau for the Medical Inspection of Schools under the direction of Dr. Geo. M. Cooper, and a Bureau for County Health Work, under the direction of Dr. B. E. Washburn, was established. Dr. Washburn, an officer of the International Health Board, was loaned to the State without cost, and the International Health Board, in addition to furnishing Dr. Washburn, appropriated \$15,000 annually for County Health Work in accordance with the provisions of Chapter 276.

The United States Public Health Service in February, 1917, detailed Dr. K. E. Miller to study county health work in different sections of the country and to establish for demonstration purposes, in Edgecombe County, department of health on an economic basis easily within the financial reach of the average county.

The State Laboratory of Hygiene moved into its own building, January 15, 1917.

The State was admitted to the registration area of the Union for births in January, 1917, the Bureau of the Census having found after investigation that our birth registration was 96 per cent complete.

The special campaign against typhoid fever begun so satisfactorily in 1915 was continued. Free vaccination of the people, however, was interfered with by the difficulty in securing medical officers to do the work, the preparedness program of the Government having caused many physicians and nurses to enter the army and navy; nevertheless, a total of 30,000 citizens of the State were vaccinated as a direct result of the Board's activities, and many thousands of others were vaccinated by the physicians of the State as a result of the educational work of the Board directed to impressing the people with the value of vaccination as a means of prevention for typhoid fever.

In December, 1917, life extension work, which consisted briefly of the free physical examination of interested citizens for the purpose of advising them as to their physical condition and needed hygienic reform and medical treatment, was begun on a county basis. The funds necessary for this work were appropriated partly by the State and partly by the counties in which the life extension work was carried out. Dr. Amzi J. Ellington, of Raleigh, who at the time was a resident physician in the New York City Hospital, was employed and placed in charge of the work. Life extension work was carried out in Vance, Alamance, Lenoir and Robeson counties, and resulted in the full physical examination of 4,000 citizens. This work was very favorably received, and the outlook for its continued development seemed excellent when, with the declaration of war and the call for physicians to enter the military service of the country, Dr. Ellington enlisted in the Medical Corps of the Army. For this reason, and for the further reason that it has been almost impossible to secure health officers during the past two years, the work was not resumed.

The educational work of the State Board of Health consisted in the issuance of eight issues of the Monthly Health Bulletin, each monthly edition amounting to 45,000, and a daily newspaper health article. The Bureau continued its moving picture show exhibit. Arrangements were made for the preparation of newspaper plate, which was sent to and extensively used by 202 papers having a total circulation of 303,000.

The annual appropriation for the State Board of Health was \$60,772.16. The annual appropriation for the State Laboratory of Hygiene was \$12,500, and this, in addition to \$9,087.22 in fees permitted under the laws of the State to be paid to the Laboratory for special work, provided the Laboratory with a total annual budget of \$21,587.22.

1918. Much of the work this year was influenced by the war and had to do with preparedness. The State Health Officer visited Washington, at the request of the Council of National Defense and as chairman of a committee of State Health Officers, on a number of occasions for conferences with respect to preparedness measures, provisions for the control of venereal diseases, arrangements for co-ordinating the control of infectious diseases in the civilian population with their control in cantonments, and to arrange, if possible, with the Public Health Service and the Surgeon-General of the Army for preserving the personnel of State health departments during the war.

Considerable time was given to assisting Major John W. Long, Medical Aide to the Governor, in the work of organizing the Medical Advisory Boards and in interesting physicians in entering the medical service of the Army and Navy, and, later in the year, in inducing the physicians of the State to become members of the Volunteer Medical Service Corps.

Partly as a result of these activities, the Surgeon-General of the Army assigned Major Joseph J. Kinyoun to assist the State Board of Health in the control of communicable diseases, the Board being under no financial obligation for Major Kinyoun's assistance; and as a result of the successful termination of the activities of various interests looking to a more effective control of venereal diseases, the Kahn-Chamberlain bill passed Congress, and made available to the State of North Carolina, and without condition, \$23,988.61 for venereal disease work.

The Laboratory during this year began the distribution of a high grade of diphtheria antitoxin.

The Bureau of Medical Inspection of Schools, under the direction of Dr. G. M. Cooper, developed, and with a degree of success that we may say established, free dental clinics for the public schools of the State. The Bureau also developed to a successful extent an arrangement in the form of adenoid and tonsil clubs for the practical and economic treatment of public school children suffering from these defects.

The Bureau of Epidemiology employed two third-year medical students, equipped them with motorcycles, and put them into the field to investigate infringements of the quarantine law. Sufficient convictions were obtained to impress the people with the determination of the State to enforce its health laws, and a fairly satisfactory compliance with the laws regarding the reporting of communicable diseases was brought about.

The Bureau of Venereal Diseases, paid for by the Federal appropriation, was established in September under the directorship of Dr. James A. Keiger.

Mr. Warren H. Booker, for the last seven years the efficient director of the Bureau of Engineering and Education, left in September for Red Cross work in France, the work of his

bureau being continued, with the exception of the engineering work, by Mr. Ronald B. Wilson, who had been employed earlier in the year to succeed Miss Herring in assisting Mr. Booker with the journalistic work, Miss Herring having been engaged by the War Department for educational work.

Perhaps the most outstanding feature of the health work during the year 1918 was the epidemic of influenza. The epidemic began early in October and caused in October alone 6,056 deaths; in November 2,133 deaths, and in December 1,497 deaths, a total during the last three months of 9,686 deaths.

The annual appropriation for the State Board of Health for 1918 was \$73,210.38.

The annual appropriation for the State Laboratory of Hygiene was \$12,500. The Laboratory, during this year, collected \$8,532.48 in fees for special work, so that the total income of the Laboratory for this year was \$21,032.48.

1919. The General Assembly passed the following important health legislation: Chapter 71, entitled "An act to prevent the spread of disease from insanitary privies"; Chapter 192, entitled "An act to provide for the physical examination and treatment of the school children of the State at regular intervals"; Chapter 206, entitled "An act for the prevention of venereal diseases"; Chapter 213, entitled "An act to require the provision of adequate sanitary equipment for public schools"; Chapter 214, entitled "An act to obtain reports of persons infected with venereal diseases"; Chapter 215, entitled "An act to amend Chapter 671, Public-Local Laws of 1913, relating to the injunction and abatement of certain nuisances."

The Bureau of Engineering and Inspection was organized in April. The engineering work of the Board had been suspended with the resignation of Mr. Warren H. Booker in September, 1918, Mr. Booker having gone to France to engage in tuberculosis work under the direction of the Red Cross. Between September, 1918, and April, 1919, the engineering problems coming before the Board had been referred and very kindly and effectively taken care of by Col. J. L. Ludlow of Winston-Salem, the engineer member of the Board. Mr. H. E. Miller, an engineer and a graduate of the University of Michigan, was placed in charge of the new bureau, and his brother, Dr. K. E. Miller, of the United States Public Health Service, was detailed by the Service to assist him in the organization of his work. Mr. H. E. Miller and Dr. K. E. Miller spent the spring and summer and a part of the fall in studying various types of privies, in preparing plans for the construction and maintenance of privies, and in preparing the necessary notices and literature to inform the people of the objects and requirements of the new privy law.

On May 1 Dr. A. J. Warren, health officer of Rowan County, was appointed to and accepted the position of Assistant Secretary of the Board.

About the first of the year, Miss Herring returned to the educational work of the Board. After a few months she returned to the Federal Service, and Mr. R. B. Wilson, who had left the Board work upon Miss Herring's return, was again offered a place with the Board. Mr. Wilson accepted and assumed his duties on July 1.

On August 1 Dr. A. McR. Crouch, Director of the Bureau of Epidemiology, resigned to accept a position with the city of Wilmington. Dr. F. M. Register, whole-time health officer of Northampton County, succeeded Dr. Crouch as director of the bureau.

Dr. E. J. Wood resigned this year, effective at the end of his term, and Governor Bickett appointed Dr. E. J. Tucker of Roxboro for six years term—first dentist to serve on Board.

In September Dr. J. R. Gordon, Director of the Bureau of Vital Statistics since 1914, resigned on account of impaired health, and on October 1st the Bureau of Epidemiology and the Bureau of Vital Statistics were combined and placed under the direction of Dr. Register.

In September Mrs. Kate Brew Vaughan, Director of the Bureau of Infant Hygiene, resigned. The bureau was reorganized under an understanding with the American Red Cross and was enlarged to include, in addition to infant hygiene, the problem of public health nursing, the name of the bureau being changed to that of "Bureau of Public Health Nursing and Infant Hygiene." Under the agreement with the Red Cross this bureau was to have an available appropriation of \$12,000 a year, half of which was to be furnished by the American Red Cross and half by the State Board of Health. The personnel of the bureau and its plan of work, under the agreement, was made contingent upon the approval of both participating agencies, the American Red Cross and the State Board of Health. In December Miss Rose M. Ehrenfeld took charge of the new bureau and began its organization and work.

On October 1 Dr. Jas. A. Keiger, Director of the Bureau of Venereal Diseases, resigned and Dr. Millard Knowlton was appointed to succeed him.

The typhoid campaign carried on during the summer through previous years was continued in the summer of 1919, using third-year medical students, furnished either with automobile or motorcycles for getting about. Campaigns were carried out in the following counties: Bertie, Cabarrus, Chatham, Chowan, Columbus, Craven, Hertford, Iredell, Johnston, Lincoln, Onslow, Pasquotank, Perquimans, Randolph,

Richmond, Rockingham, Stanly, Union, Warren, Wayne. A total of 49,076 were given complete vaccination.

The educational work of the Board consisted of the publication of 48,000 monthly edition of the Bulletin, and the distribution of about 350,000 pieces of public health literature.

The funds available during this fiscal year amounted to \$198,549.14, of which \$102,301.98 was from State appropriations and the remainder from outside sources.

The appropriation for the State Laboratory of Hygiene for this year was \$28,500; in addition to this, the Laboratory collected in fees for special work, for antitoxin, and in water taxes a total of \$14,344.02, making a total of \$42,844.02 available for work of Laboratory.

1920. During this year there was a Special Session of the General Assembly, lasting twenty days and held in the latter part of August. This Special Session passed an act amending the vital statistics law, making the fees for local registrars 50 cents instead of 25 cents for each certificate properly filed with the State Board of Health.

On January 1 Dr. B. E. Washburn, who had had general direction of the co-operative county health work and who had rendered most acceptable service, was recalled by the International Health Board and detailed to take charge of their interests in Jamaica. Dr. K. E. Miller, of the United States Public Health Service, who had been detailed in January, 1917, to organize a model county health department in Edgecombe County and then, in 1919, to assist his brother, Mr. H. E. Miller, in organizing the work of the new Bureau of Engineering and Inspection, to which was assigned the duty of enforcing the State-wide privy act, succeeded Dr. Washburn as director of the Bureau of County Health Work.

In January a co-operative effort with the United States Public Health Service and the International Health Board to demonstrate the possibilities and advantages of the eradication of malaria from certain towns and cities in the eastern part of the State was begun. The terms of co-operation were that the International Health Board and the State Board of Health were to pay one-half of the expenses of the local work and the town or city in which the work was done the other half, the Public Health Service furnishing, as its part, expert supervising personnel. The towns and cities chosen for this work were Goldsboro, Farmville, and Greenville, the budget for each municipality being, respectively: Goldsboro, \$13,-670.98; Farmville, \$5,000, and Greenville, \$9,000, a total investment in this work of \$27,670.98. Mr. A. W. Fuchs, Associate Sanitary Engineer, was detailed by the Service to have supervision of the work.

In February Dr. A. J. Warren, Assistant Secretary of the State Board of Health, resigned his position in order to accept the appointment of city health officer of Charlotte, N. C.

In the winter and spring of 1920 the North Carolina Landowners' Association, under the progressive leadership of Mr. W. A. McGirt, of Wilmington, undertook a very extensive educational campaign against malaria, which was carried on through the public schools of thirty-eight counties in eastern North Carolina. A series of county and State prizes for the best essay on malaria by public school children were offered as an inducement to the school children to interest and inform themselves and, indirectly, their parents with regard to the importance of this disease. To make possible this work by the school children 75,000 malaria catechisms, prepared by Dr. H. R. Carter, of the United States Public Health Service, were distributed through the public schools of the eastern part of the State to the school children. Thousands of essays were written, and it is reasonable to believe that the campaign was one of the most successful public health educational attempts yet undertaken.

In June it was found advisable to separate the Bureau of Epidemiology and the Bureau of Vital Statistics which had, on account of the scarcity of health officers, been placed under the dictatorship of a single bureau chief, Dr. F. M. Register. Dr. Register was appointed Director of the Bureau of Vital Statistics and Dr. J. S. Mitchener was appointed Director of the Bureau of Epidemiology.

In April the Interdepartmental Social Hygiene Board assigned to the State Board of Health several workers for making a study of vice conditions in North Carolina towns and cities and for taking such steps as were found expedient for decreasing prostitution. This group of workers was withdrawn in September on account of differences developing between them and Dr. Knowlton, chief of the Bureau of Venereal Diseases, with the understanding that another group of workers would be assigned to this work at a later date.

In June arrangements were made with the United States Public Health Service and the American Social Hygiene Association for the development of an elaborate educational unit on sex hygiene and venereal diseases designed to reach rural meetings through the use of picture films and a portable truck. An outfit consisting of several lectures and a moving picture truck began work in Cumberland County in August, and from its very beginning met a most cordial reception and gave every promise of developing into one of the most useful agencies for dealing with the venereal disease problem.

During the year anti-typhoid vaccination campaign was continued in Alamance, Bladen, Columbus, Duplin, Franklin, Gaston, Harnett and Mecklenburg counties. Co-operative campaigns, in which the counties furnished the working personnel, were also carried on in Anson, Johnston and Rutherford counties. A total of 29,435 citizens have been vaccinated

against the disease, and this does not include Columbus County, in which the work was just beginning when this report was completed.

The educational work of the State Board of Health during this year consisted of a 48,000 monthly edition of the State Board of Health Bulletin and the distribution of approximately 350,000 pieces of public health literature.

The funds available during this fiscal year amounted to \$342,284.33, of which \$176,152.61 was State appropriation and the remainder from outside sources.

The appropriation for the State Laboratory of Hygiene for this year was \$25,000; in addition to this, the Laboratory collected in fees for special work, for antitoxin and in water taxes, a total of \$13,698.89, making a total of \$38,698.89 available for the work of the Laboratory. The above amount being insufficient, the Special Session of the Legislature authorized a loan of \$15,000 to enable the work of the Laboratory to be carried on, making a total of \$53,698.89 available for the work of the Laboratory during this year.

1921. The Legislature meeting early in January of this year was asked by the Board to amend the State law restricting the salary of the executive officer of the Board to \$3,000 annually, so as to make the salary \$5,000. Such an amendment was passed. A further request from the Board was that legislation be enacted removing the inspection tax of forty cents from privies coming under the supervision of the Board of Health. Such an amendment to the State-wide Privy Law was also enacted. A bill was introduced in this session of the General Assembly under the initiative of Hon. Emmet H. Bellamy requiring a physical examination of all applicants for marriage and making issuance of license contingent upon the physical qualifications of the applicant. The State Board of Health approved and supported Mr. Bellamy's bill, realizing, as did the author of the bill, that the proposed legislation was but a step in the right direction and was, therefore, rather loosely drawn and left many things to be desired. The bill finally passed in amended form as Chapter 129, Public Laws of 1921.

The Governor appointed Mr. Chas. E. Waddell, an engineer, of Asheville, to succeed Col. J. L. Ludlow as the engineer member of the Board.

Perhaps the most important change inaugurated in State health administration during this year was the adoption of a cost basis for standardizing and measuring the efficiency of public health work in those counties in which the State participated financially. This new principle is fully described in the State Board of Health Bulletin for January, 1922, and a further discussion of cost basis for public health work is unnecessary here except, perhaps, to say that it is apparently

at least one of the first attempts to introduce the cost system of industry into government.

The Bureau of Venereal Diseases, in charge of Dr. Millard Knowlton, established as a part of the war-time activities of the Board in co-operation with the Bureau of Venereal Diseases of the Federal Government, was combined with and made a part of the work of the Bureau of Epidemiology, under the general direction of Dr. J. S. Mitchener.

Funds available for the year included: State appropriation, \$275,000; miscellaneous receipts, \$164,184.42; total, \$439,184.42.

1922. In order to bring the records of this department into harmony with those of other State departments, in accordance with the Act of the General Assembly of 1921, changing the fiscal year of the State so as to begin on July 1st each year, this report ends with June 30, 1922. It, therefore, covers a period of nineteen months; one full fiscal year from December 1, 1920, to November 30, 1921; seven months from December 1, 1921, to June 30, 1922. Effective February 1, the American Red Cross Society abrogated the agreement existing since 1919 by which it jointly financed, with the Board of Health, the Bureau of Public Health Nursing and Infant Hygiene. This bureau was reorganized April 1 as the Bureau of Maternity and Infancy, for its maintenance the State receiving \$27,259.66 annually from the United States Government in accordance with the Sheppard-Towner Act for the promotion of the welfare of mothers and infants. Dr. K. P. B. Bonner, of Morehead City, was secured as the director of the reorganized bureau, with Miss Rose M. Ehrenfeld as supervisor of nursing and Mrs. T. W. Bickett in charge of educational work.

The funds available during this period, and their distribution were seven-twelfths of the amounts set out under the tabulation for 1921.

The appropriation for the State Laboratory of Hygiene for the nineteen months between December 1, 1920, and June 30, 1922, was \$87,083.33; in addition to this, the Laboratory collected in fees for special work, for antitoxin and in water taxes, a total of \$30,872.51, making a total of \$117,955.84 available for the work of the Laboratory.

1923. The General Assembly of 1923 enacted some important and far-reaching legislation affecting public health work in North Carolina. The most important legislation enacted this year was the act providing for an independent board of directors for the State Sanatorium for Tuberculosis, removing the direction of that institution from the authority of the State Board of Health. Facilities were also provided at the State Sanatorium for the confinement, care, and treatment of tuberculosis convicts. Other legislation included the act to provide for the sanitary manufacture of bedding, the latter act to be

enforced by the State Board of Health. The Bureau of Epidemiology was again combined with the Bureau of Vital Statistics.

On March 1 Dr. G. M. Cooper was made Assistant Secretary of the State Board of Health, and Dr. J. S. Mitchener was assigned to the Bureau of Medical Inspection of Schools, after the consolidation of the Epidemiology work, which he had directed, with the Bureau of Vital Statistics. Dr. K. E. Miller, of the United States Public Health Service, was recalled for duty elsewhere.

In order to experiment with the plan of District Health Work, an effort was made to place responsibility for all State Board of Health activities under the direction of district directors attached to the staff of the State Board of Health. This effort was continued throughout the year, but proved to be ineffective and unsatisfactory.

During the year Dr. F. R. Harris resigned from membership on the State Board of Health to become health officer of Vance County. The Board elected Dr. D. A. Stanton, of High Point, to fill the unexpired term of Dr. Harris.

In order to further carry on the important work of malaria control in a number of the counties of the coastal plain area of the State, which work was so effectively commenced in an educational capacity in 1920, the International Health Board was requested to participate in this work and to provide a director for that service. The International Health Board agreed, accepted the invitation, and assigned Dr. H. A. Taylor, of Alabama, to head this division. Pamlico County was selected as headquarters for Dr. Taylor. The cost of this work was borne by the State Board of Health and Pamlico County contributing 40 per cent each, and the International Health Board the remaining 20 per cent. The International Health Board, of course, paid the salary of Dr. Taylor.

In June Dr. J. S. Mitchener resigned as director of the Bureau of Medical Inspection of Schools and Dr. Roy C. Mitchell, who had been doing some special educational field work for the Board, temporarily succeeded Dr. Mitchener.

Early in 1923 Dr. W. S. Rankin, the State Health Officer, was invited by the Committee of Municipal Health Department Practice of the American Public Health Association to become field director for the committee in making a study of municipal health practices in the United States. This was for the purpose of working out a basis or set of principles through which city health departments could be given classification or grading, and also for the purpose of assisting such departments in their organization work. The request was brought before a special meeting of the executive committee of the Board, and it directed the Secretary to take advantage of the opportunity offered. The Board granted to the Secretary one year's leave

of absence, but requested him at the same time to continue in touch as executive officer of the Board with the work of the Board.

On November 1 Dr. Rankin assumed his duties and established official headquarters in New York City for the work of the committee.

The general organization of the executive staff of the Board was continued with the Assistant Secretary, Dr. G. M. Cooper, as official head of the staff. Local health work in the eastern half of the State was directed by Dr. H. A. Taylor, and that in the western part of the State by Dr. E. F. Long, who had been assistant to Dr. K. E. Miller as director of county health work. To assist Dr. Taylor in the east, Dr. George Collins, formerly health officer of Mecklenburg County, was employed, and to assist Dr. Long in the western half of the State Dr. C. N. Sisk, formerly health officer of Forsyth County, was employed.

During the year a plan for the more adequate sanitary control of public milk supplies in the State was formulated. This work was undertaken under the direction of the Bureau of Engineering and Inspection, and Mr. Malcolm Lewis was employed to organize this work. Several changes in personnel took place this year. Dr. M. L. Iseley, who had been employed in county health department work, and Dr. Roy C. Mitchell resigned. Miss Rose M. Ehrenfeld also resigned.

1924. During this year Dr. Rankin continued his work with the American Public Health Association until November 1. During this period the work of the Board was directed by Dr. G. M. Cooper, serving as Acting Secretary. On November 1 Dr. Rankin returned, and during that month, under the direction of Dr. Maxey of the United States Public Health Service, a school for health officers was conducted under the auspices of the State Board of Health for one week in Raleigh. This meeting was well attended, and every modern method which might be utilized in the work of a modern public health department was discussed throughout the week.

Dr. M. L. Townsend was placed in charge of the Division of Health Education. Dr. K. P. B. Bonner resigned as director of the Bureau of Maternity and Infancy.

1925. Dr. Rankin resigned, effective June 1, to accept the position of director of the Hospital and Orphan Division of the Duke Foundation. At a meeting of the Board of Health on May 30 Dr. G. M. Cooper was unanimously made Acting Secretary for an indefinite period of time to succeed Dr. Rankin. During the year Dr. E. F. Long resigned as director of county health work and Dr. C. N. Sisk, who had been assistant to Dr. Long, was placed in charge of county health work, without an assistant.
1926. On June 21 Dr. Charles O'H. Laughinghouse, a member of the Board, was elected permanent Secretary and State Health

Officer to fill the unexpired term of Dr. Rankin. Dr. Laughinghouse accepted and took office October 1. Dr. G. M. Cooper, who had for sixteen months administered the work of the Board as Acting State Health Officer, continued with the service and was assigned to the Bureau of Health Education, succeeding Dr. M. L. Townsend, who resigned. On August 6 Dr. Richard H. Lewis died. Dr. Lewis had served as a member of the Board since 1885, and from 1892 to 1909 he served as Secretary of the Board. Since 1909 he had been a member of the executive committee. Dr. Lewis held his membership on the Board by appointment from the Governor. To fill the term of Dr. Lewis, expiring in 1931, Governor McLean appointed Dr. John B. Wright, of Raleigh. Among other reasons assigned for this appointment, the Governor stated that it had been the rule since the Board of Health was established to have at least one of the members of the Board a resident of Raleigh.

When Dr. Laughinghouse resigned, in order to accept the election to the position of State Health Officer by his fellow members on the Board, the remaining members of the Board elected Dr. W. S. Rankin, of Charlotte, former Secretary of the Board, to succeed Dr. Laughinghouse.

1927. There were no changes in personnel or in staff organizations during the year 1927. The most important event occurring this year was the death of Dr. J. Howell Way on September 22. Dr. Way had been a member of the Board for many years and had been President of the Board for a long time. Governor McLean appointed Dr. C. C. Orr, of Asheville, to succeed Dr. Way. At the first meeting of the State Board of Health following the death of Dr. Way, Dr. A. J. Crowell, of Charlotte, was made President of the Board. In April of this year Dr. W. S. Rankin resigned as a member of the Board, and Dr. L. E. McDaniel, of Jackson, was elected by the other members of the Board to succeed Dr. Rankin.
1928. Dr. J. C. Johnson, who had been director of the Oral Hygiene Division, resigned as director of the oral hygiene work of the Board, effective December 31.

During this year a corps of nurses employed in the Maternity and Infancy Division of the Board, one-half of whose expenses were paid by the Federal Government from Sheppard-Towner funds, held midwife classes in about thirty counties of the State. The nurses gave special instruction to midwives in groups, and the county authorities enacted midwife rules and regulations for the control of their practice.

The educational work of the Board was of a high order during this year. A thirty-two page Bulletin was issued monthly, and a moving picture machine with several films on modern health subjects was exhibited in many sections of the State.

1929. With aid secured from the International Health Board, the Life Extension Division was added to the activities of the Board this year. Dr. Frederick R. Taylor, of High Point, was made director of this division. Dr. Taylor carried this work before the medical profession in all sections of the State.

On January 1 Dr. Ernest A. Branch accepted the appointment as director of the Division of Oral Hygiene to succeed Dr. J. C. Johnson, resigned. Dr. Branch immediately set in motion reorganization plans for the oral hygiene work to include more lectures and more educational demonstration work. Dr. Branch made contacts with several of the colleges of the State and training schools for teachers.

Expenditures for the Board work this year reached the highest peak in the history of the Board, totalling about \$486,000. There were no significant changes, other than those mentioned above, in personnel during this year.

1930. This year marked many significant changes in the affairs of the State Board of Health. Early in the year Dr. C. N. Sisk, director of county health work, resigned. Dr. D. A. Dees succeeded Dr. Sisk as director of county health work. Soon after the resignation of Dr. Sisk, Dr. F. M. Register, director of the Bureau of Vital Statistics, resigned, and the work of that bureau was assigned to Dr. G. M. Cooper, in connection with his work as director of health education. On August 26 Dr. Chas. O'H. Laughinghouse, State Health Officer, died. Soon after his death, in a meeting of the Board, Dr. H. A. Taylor was made Acting State Health Officer. On September 24, following the death of Dr. Laughinghouse, the Board elected Dr. W. P. Jacocks State Health Officer to succeed Dr. Laughinghouse. On November 20 Dr. Cyrus Thompson, for many years a member of the Board, died. On December 16 the Board met and unanimously elected Dr. James M. Parrott, of Kinston, as a member to succeed Dr. Thompson.
1931. At the beginning of this year, Doctor Jacocks having declined to accept the position of State Health Officer, to which he had been elected by the Board on September 24, 1930, a bill was introduced in the Legislature abolishing the State Board of Health as then constituted. This bill was passed and became law during the session of 1931. With the enactment of the new law the terms of the members of the old Board were automatically terminated. Under this new law governing the State health work, legislative machinery providing for the establishment of a new organization to carry on the public health work of the State was enacted. The new law differs in many respects from the old law under which the Board had operated for so long. However, the most important provision of the old law was retained; that is, the non-political character of the Board and the retention of the permanency of the policies of the Board, although shortening the terms of office

and making it impossible for the Board to become a self-perpetuating machine.

The important provisions in the new law under which the Board of Health work is now operating are as follows: The Governor still retains the power to appoint five of the nine members of the Board, the maximum term of office being four years instead of six, as under the old law, and no member to serve more than two terms, making the total tenure of office of any member not to exceed eight years. The Medical Society of the State of North Carolina still retains the power to elect four of the nine members of the Board, the same conditions as to term of office to obtain here as in those appointed by the Governor. It was recommended to the Governor, although not written into the law, and Governor Gardner accepted the suggestion, that he appoint one member from the State Dental Society and that he appoint a man recommended by that society. This is equivalent to allowing the State Dental Society to name one of the members, but still leaves the balance of power in the hands of the Governor. This seems to be a very satisfactory arrangement.

Another important change is that the Board still elects the State Health Officer, but it can only become effective upon the approval of the Governor. The term of the State Health Officer, along with members of the Board of Health, was restricted to four years, with the privilege of being re-elected one time.

Following the adjournment of the Legislature, the Governor appointed the following named members: Drs. J. T. Burrus, High Point; H. Lee Large, Rocky Mount; J. N. Johnson, Goldsboro, the dental member; Professor H. G. Baity, of the University of North Carolina, and Mr. J. A. Goode, a druggist of Asheville. The State Medical Society at its first meeting after the adjournment of the Legislature elected the following physicians to membership: Drs. James M. Parrott, Kinston; Carl V. Reynolds, Asheville; S. D. Craig, Winston-Salem; L. B. Evans, Windsor.

It will be noted that Dr. Parrott was the only member of the outgoing Board honored with election to membership on the new Board.

On May 28 the new Board met and organized. On that day it unanimously elected Dr. James M. Parrott State Health Officer. Dr. Parrott took the offer under consideration for a period of two weeks. On June 11 the Board met again; Dr. Parrott accepted the election and agreed to assume office on July 1. Dr. Parrott resigned his membership on the Board before being elected to the position of State Health Officer, and under the provisions of the new law the executive committee of the State Medical Society selected Dr. G. G. Dixon, of Ayden, to serve in Dr. Parrott's place until the 1932 meeting of the State

Medical Society. It will be noted that this is an important variation from the provisions of the old law. Under the old law the other members of the Board held the authority to name a successor, whether a member resigned or died. Under the new law the Governor names his vacancies in his list and the executive committee of the State Medical Society is permitted to name a successor to serve only until the first meeting of the State Medical Society follows.

In the meeting of June 11 the new Board found it necessary to eliminate some members of the staff and to make some consolidations, on account of reduced appropriations for the Board work. The services of Dr. D. A. Dees and Mr. R. B. Wilson were dispensed with, effective July 1. The Board reorganized the staff and made many consolidations. The new reorganization follows:

The Board reorganized the work into divisions, making many consolidations and increasing the duties of the directors of each division. Following are the divisions organized: Administrative Officer, Dr. James M. Parrott; Director Division of Laboratories, Dr. C. A. Shore; Director Division of Preventive Medicine, Dr. G. M. Cooper; Director Division of Oral Hygiene, Dr. Ernest A. Branch. The division of County Health Work and Epidemiology was temporarily assigned to Dr. H. A. Taylor, but on August 3 Dr. Taylor resigned and Dr. John H. Hamilton, health officer of New Hanover County, was appointed director of this division. The position of director of Division of Sanitary Engineering was filled on July 14 by electing Mr. Warren H. Booker, who had formerly headed that work, to succeed Mr. H. E. Miller.

The election of Dr. Parrott was received throughout medical and public health circles of the entire State with enthusiasm. Under his able direction the work of the Board during the last half of this year moved with a precision which was gratifying to all the friends of public health work in the State.

1932. The year 1932 was uneventful in public health work. The term of none of the members of the Board expired this year, but all members continued their service just as the Board was constituted at the close of 1931.

The International Health Board awarded a scholarship to Dr. J. C. Knox for a year's special Public Health Work at Harvard and to Dr. R. T. Stimpson for a year's special work in the School of Hygiene at Johns Hopkins.

Following the very favorable reception of Doctor Parrott's annual report at the conjoint session of the State Board of Health and the State Medical Society, which was presented at Winston-Salem in April, the work of the Board was carried on on all fronts with satisfactory results, although on account of reduced appropriations many activities carried on in previous years had to be curtailed or definitely eliminated.

The death rate in North Carolina for 1932 was 9.6 per 1,000 population. This is the lowest death rate ever before recorded in North Carolina. The trend in typhoid fever death rates has been consistently downward from 1914 to 1930. This year there were three more deaths than in 1931, there occurring a total of 158 deaths from typhoid fever. The increase in population, however, offset the slight increase in number, and the rate recorded was slightly lower than 1931. The cases and deaths from diphtheria this year were also the lowest of any previous year, although progress in the elimination of these diseases has not been so satisfactory as it should have been. Deaths from pellagra continue to show a marked decline.

This year is the third year of the so-called financial depression, and it is too early to record any opinion as to what effect unemployment and decreased income and rather widespread suffering may have on the health of the people of the State. It is not too much to say, however, that the effect will be felt more severely by the children than by any other class of the population.

The infant mortality this year was 66.4 per 1,000 live births. This is so far the best record the State has ever made. The maternal mortality remains high, and indications are that with decreased expenditures for maternal and infant hygiene the rates, particularly for infant deaths, will rise again, pushing the State back among those having an excessive infant death rate.

Expenditures for this year for all purposes by the Board were \$315,276, of which amount \$262,438 represented appropriations. This amount was just a little more than half of the total expenditures made by the Board of Health for the fiscal year ending June 30, 1930.

1933. The events of outstanding importance to the Board of Health this year was the death of Dr. C. A. Shore, which occurred on February 10. For twenty-five years Doctor Shore had been director of the State Laboratory of Hygiene. He had built the work of the laboratory during these years up to a point where its prestige and usefulness was equal to that of any other public health laboratory in America.

Doctor Shore served longer as a member of the executive staff than any other man who has ever been connected with the State Board of Health. He held the confidence and esteem of the medical profession as well as the general public to a marked degree. He was a man of extraordinary ability, and much of the success of the public health work in North Carolina may be attributed to his fine and wholesome service.

Suitable tribute has been paid to Doctor Shore and recorded in other publications of the Board and of the State Medical Society. One event in this connection, however, should be recorded here, and that is that by legislative action all buildings of the State Laboratory of Hygiene are hereinafter to be

known as The Clarence A. Shore Laboratory, in memory of his distinctive service.

A few weeks after the death of Doctor Shore, Dr. John H. Hamilton, director of County Health Work, of Vital Statistics, and of Epidemiology, was made director of the laboratory work. Doctor Hamilton, on assuming his duties as director of the Laboratory, resigned the duties of director of County Health Work and of Epidemiology, but retained, however, with the assistance of Dr. R. T. Stimpson as statistician and field director, the Bureau of Vital Statistics. Dr. D. F. Milam, a consultant assigned to the State Board of Health by the International Health Board, was made acting director of the Bureau of Epidemiology in place of Doctor Hamilton. Doctor Milam had as his assistant Dr. J. C. Knox. Dr. M. V. Ziegler, consultant assigned to the Board by the United States Public Health Service, assumed the duties of acting director of County Health Work to succeed Doctor Hamilton. During this year Mr. W. D. Riley, assigned to the work as Venereal Disease Control Officer by the United States Public Health Service, organized his work and succeeded in making an important contribution to the work of the Venereal Disease Control in North Carolina.

The following changes in personnel of the State Board of Health took place during this year: Dr. W. T. Rainey, of Fayetteville, was elected by the State Medical Society for a four-year term to succeed Dr. L. B. Evans, of Windsor, whose term expired this year. Dr. S. D. Craig was re-elected for a term of four more years. The Governor reappointed Dr. J. N. Johnson, dental member of the Board, for another term, which will expire in 1937. The Governor appointed Dr. Hubert B. Haywood, of Raleigh, for a four-year term, to take the place of Dr. J. T. Burrus, of High Point. The Governor also appointed Mr. James P. Stowe, a druggist of Charlotte, for a four-year term, expiring in 1937. Mr. Stowe succeeded Mr. J. A. Goode, a druggist of Asheville. Dr. Carl V. Reynolds succeeded Dr. Burrus as President of the Board. On July 1 Drs. Knox and Stimpson returned to the Board work and resumed their places after satisfactorily concluding their year's scholarship work at Harvard and Hopkins, respectively.

The year was not marked by any widespread outbreak of epidemic disease, and, notwithstanding a continuation of the financial depression, the work of the State Board of Health held up fairly well. The appropriations being lower this year than before for many years, much of the personnel service had to be reduced. A material reduction in State aid to County Health Work caused considerable contraction of the activities of County Health Department Work, but for the most part the morale of State Board of Health employees as well as the county health employees has held up remarkably well.

The Legislature, meeting for an extended session following its opening in January, made drastic reductions in appropriations to all State health work and reduced the salaries of all State health employees. This was said to be necessary in order to balance the State budget and to maintain the State's credit.

The total expenditures for the Board of Health this year, that is, for the fiscal year ending June 30, were \$291,786. Of this amount \$225,274 was appropriated by the Legislature. It will be noted that this sum was less than half of that appropriated and spent for the fiscal year ending June 30, 1930.

1934. The event of greatest importance to the State Board of Health and to the health work throughout the State in this year was the death of Dr. James M. Parrott and the election of Dr. Carl V. Reynolds as his successor. Dr. Parrott assumed the duties of State Health Officer on July 1, 1931. He had thus served a little more than three years and four months at the time of his death. Dr. Parrott was the first State Health Officer to serve under the new, or reorganized, Board of Health. He was stricken with an attack of angina pectoris early in December, 1933. The last eleven months of his life, therefore, were ones of recurring illness and courageous fortitude in remaining at the helm of the Board of Health work. On the occasion of the first illness, with the consent of the members of the State Board of Health, he designated Dr. G. M. Cooper as Acting State Health Officer to be the responsible head of the work in such periods as he was physically unable to attend to the duties of the office. The following sketch concerning Dr. Parrott and his work, written by the Editor, was published in the Health Bulletin:

"The death of Dr. James M. Parrott, State Health Officer of North Carolina, occurred on Wednesday evening, November 7, 1934. Doctor Parrott had been health officer of North Carolina for a little more than three years. He was so active mentally and so near and dear to his co-workers here at the office that to me, even yet, it seems impossible and unbelievable to think that he is dead. Nearly thirty years ago I 'took' the State Board examination for license to practice medicine. He was a member of that board. From then on I looked on him as one of the big men in the medical profession. He held every office within the gift of his profession and loved it and served its interests with a passionate devotion.

"He took over the direction of the work of the State Board of Health in one of the darkest hours in the history of the Board. He brought to the affairs of the Board a new kind of leadership, a fresh outlook, a new viewpoint, and a breadth of vision which served notice on the world that the Board had a resourceful and able executive in charge. Although he came to the Board work without previous experience in an adminis-

trative capacity of this type, and knowing little or nothing of the practical workings of a modern public health organization, his chief contribution, which will be duly recorded in the history of this period, to the cause of public health advancement was his stand for the professionalization of public health work.

"Before he had been here sixty days, he realized that all department divisions as well as all county health offices should be manned by physicians technically trained and experienced in public health work. It became necessary for him to oppose the ambitions of some of his lifelong friends in the medical profession, which hurt him; but it may be said to his credit that he stood four-square for competently trained men as public health officials.

"On assuming office, he realized that he had some very unpleasant duties confronting him in reorganizing the work of the Board. He soon demonstrated that he had convictions and the courage to back them up. When he laid down his armor for the great adventure, he left an organization of his own building functioning at top speed. He proved to his fellow workers here that he was tolerant to everything but laziness and lying and inefficiency. Being a man of clean personal life, and governed in all his actions by a strict sense of honor, he naturally expected such qualities in his staff and other subordinates.

"For the past year he struggled against the malady which finally ended his life, and at the same time he felt keenly his official responsibility. He knew all during that last year that, in justice to himself and his family, he should resign and be relieved of the extra tax on his failing strength. On the other hand, he felt that his work was not quite done. He saw many essential features of public health work sacrificed to a program of questionable economy. He did not question the good intentions of the Governor, the Budget Bureau, nor the Legislature, but he felt that the time had come to put an end to the further needless sacrifice of human life for the lack of intelligent preventive efforts. He had a conviction that the incoming General Assembly would see eye to eye with him. He was ready to submit a program of far-reaching importance to the people of the State. It could not be. His big brain is forever inactive. His profound knowledge of the public health needs of the people is left for his successor to acquire for himself.

"No man could build for himself a better monument than Doctor Parrott did in the record of worth-while work well done. In his death the State loses an honest public servant, and I lose a warm and understanding friend whose confidence was more precious to me than the riches of Araby."

Following Dr. Parrott's death, the State Board of Health assembled in Raleigh on November 10, 1934, and unanimously elected Dr. Carl V. Reynolds, who at that time was serving as

President of the Board, to the position of State Health Officer and Secretary and Treasurer of the State Board of Health. Dr. Reynolds immediately accepted and assumed his duties at once. The following Editorial appeared in the Health Bulletin in January, 1935, concerning Dr. Reynolds and his work. It is herewith reproduced in order that this chronological record may be complete:

"Doctor Carl Vernon Reynolds, of Asheville, on November 10 took the oath of office and immediately assumed his duties as Acting State Health Officer, succeeding Dr. James M. Parrott, who died November 7. Doctor Reynolds was unanimously elected to the position by his fellow members on the Board.

"Doctor Reynolds is a native of Asheville. His father was a successful Asheville physician who died when Doctor Reynolds was only three years old. Doctor Reynolds obtained his literary education in the private schools of Asheville and Wofford College, Spartanburg, South Carolina. He received his medical education at the college of the City of New York, graduating in medicine there in 1895. After his graduation he took a postgraduate course in London, England. Doctor Reynolds located in Asheville for the practice of medicine, specializing in pulmonary tuberculosis. His skill in combating that disease has been widely recognized by the medical profession. An example of their confidence was his election as president of the North Carolina Medical Society, in which place he served with distinction in 1920.

"On beginning practice he at once became interested in health work. His first connection was with the city health department in 1896. Following that period, for more than twenty years he served as city health officer of Asheville, in which capacity he rendered his city and the whole State important and permanent service. Some of his contributions to public health may be cited, as follows:

"He organized the first crusade against the common housefly ever undertaken anywhere.

"He assisted in drafting the first milk ordinance for Asheville.

"He secured progressive sanitary laws.

"He put through the compulsory vaccination law requisite to school attendance.

"He secured the adoption of a bread-wrapping ordinance and one requiring the tuberculin testing of cows.

"He saw typhoid fever drop from an average of two hundred and seventy cases a year in the city of Asheville to about five while he was city health officer, and saw smallpox practically eliminated.

"We enumerate these things so that the people of the State may know they have a well-trained health officer at the head of the State Health Department—one fully worthy of confidence and support."

The general routine work of the State Board of Health during this year was satisfactory and successful in every way. Dr. D. F. Milam, who had been loaned to the State Board of Health by the International Health Board and who had been acting as State Epidemiologist, was transferred to other fields and on the first of July Dr. J. C. Knox, who had been Assistant in the Division of Epidemiology, became State Epidemiologist.

Dr. M. V. Zeigler, of the United States Public Health Service, who had also been loaned by that organization as a consultant in the Division of County Health work and who had been Acting Director of that Division, was transferred back to Washington about the first of September. Dr. R. E. Fox, who had completed a postgraduate course in the Public Health School of Harvard University, was made Director of the Division of County Health Work.

Dr. R. T. Stimpson, who had also successfully completed a postgraduate course in the School of Public Health of Johns Hopkins University, and who had been acting as Assistant in the Department of Vital Statistics, was made Director of that Division.

On November 10, at the time Dr. Reynolds was elected State Health Officer, Dr. G. M. Cooper was elected Assistant State Health Officer. Dr. Reynolds, of course, had to resign from his place on the Board in order to accept the office of State Health Officer. To succeed him as President, Dr. S. D. Craig of Winston-Salem was elected to that position. Dr. J. N. Johnson of Goldsboro, dental member of the Board of Health, was elected to the place of Vice-President of the Board. The law provides that in case of a vacancy occurring on the State Board of Health among the membership elected by the State Medical Society, that the Executive Committee of the Medical Society of the State of North Carolina shall have the authority to appoint a successor to serve until the next ensuing meeting of the State Society. In this case, the vacancy coming so close to the annual meeting of the State Society and the Board of Health on the following May 1 and there being no regularly scheduled meeting of the Executive Committee of the State Medical Society, it was decided to defer the election of a successor to Dr. Reynolds to the meeting of the Society the following May 1.

1935. Dr. Carl V. Reynolds served as Acting State Health Officer, the Governor having deferred the approval of his election the previous November 10, 1934, but at the annual meeting of the State Board of Health, which was held in Pinehurst May 7, 1935, Dr. Reynolds was unanimously elected State Health Officer. His election was for a full four year term to begin on the first of July following. The Governor immediately approved the election of Dr. Reynolds to be State Health Officer for the full term as stated.

At the meeting of the conjoint session at Pinchurst on Wednesday, May 8, Dr. Grady G. Dixon was re-elected to succeed himself to membership on the State Board of Health for a term of four years.

Dr. J. LaBruce Ward of Asheville was elected for the four year term to succeed Dr. Carl V. Reynolds, resigned.

In this year an important development in public health work was the experimental course put on in the school year of 1934-1935 at the University of North Carolina, under the auspices of the Public Health Administration, of a course of instruction designed to prepare physicians for positions as health officers. The courses in this school met with such success, plans were perfected to enlarge the scope of this new school as a part of the Medical School at the University. A fuller description of the inauguration of this school will be found under the records for 1936.

During this year following the enactment of the National Social Security law, plans were worked out for an expansion of the work of all the divisions of the State Board of Health, through financial aid coming through the Children's Bureau and the United States Public Health Service at Washington. It was a year which noted much activity in public health work all throughout the State, and the perfection of plans, State and local, for extending health department activities.

A Division of Industrial Hygiene was tentatively established in September of this year. The organization of this division resulted from an amendment to the Compensation Laws of the State by the 1935 General Assembly. This legislation made disablement or death by occupational disease interpretable as an injury by accident and thus compensable. For the execution of this legislation a sum of \$10,000 was appropriated by the Legislature. The Industrial Commission appreciating that a problem of preventive medicine was involved, engaged in a series of conferences with the State Board of Health and Officers of the United States Public Health Service. The discussions culminated in the \$10,000 appropriated for the administration of the occupational disease legislation being placed at the disposal of the State Health Officer. With this money, an Industrial Hygiene program was inaugurated as an activity of the State Board of Health. This arrangement was made with the understanding that the work would be subsidized by the United States Public Health Service when Social Security funds should become available. To begin the work of this division and to prepare the program for enlargement to its full scope, Dr. H. F. Eason of the State Sanatorium for Tuberculosis Medical Staff was selected as the Director of the division. Mr. M. F. Trice, formerly of the Division of Sanitary Engineering of the State Board of Health, was made Engineer of this new division.

1936. What may be termed the outstanding event of importance for the first half of this calendar year covered in the period of this report may be said to be the definite establishment of the new public health department at the University of North Carolina and the selection of Dr. Milton J. Rosenau as its director. This new department, of course, is an integral part of the School of Medicine of the University of North Carolina. The March issue of the Health Bulletin published the following descriptive news item of the inauguration of this department:

"The most important development in public health circles in many years for this section of the South is the establishment at Chapel Hill of a department of public health in connection with the School of Medicine, and the selection of Dr. Milton J. Rosenau as its director. This development has been made possible by the co-ordination of the staffs of the faculties of the North Carolina State Board of Health and the schools of medicine and engineering of the University of North Carolina.

"The new department, while an integral part of the University School of Medicine with Dr. C. S. Mangum, Dean, will be under the personal direction of Dr. Rosenau. Dr. Rosenau is generally regarded as America's foremost authority on public health. His books on preventive medicine are used everywhere as standard textbooks in all schools of public health. Until his retirement recently from that faculty he had been head of the famous Harvard School of Public Health for many years.

"For a long time the officials of the State Board of Health have worked hard to secure the establishment of such a school. The necessity for it has been apparent to all responsible health workers. The chief credit for success in launching the enterprise should go to Dr. Charles S. Mangum, Dean of the University Medical School, and to Dr. Carl V. Reynolds, State Health Officer. Both of these officials have worked hard and cooperated with each other in overcoming all difficulties in the way of the establishment of the new department.

"In the opinion of Drs. Mangum and Reynolds the development was in part made possible by the success of the course put on in the school year of 1934 and 1935 at the University under the auspices of the School of Public Administration. The first course put on with the teaching aid of the Schools of Medicine and Engineering of the University and members of the staff of the State Board of Health comprised a course of instruction for physicians in public health administration and extended over a period of twelve weeks. The work was so excellently done that they received recognition from the United States Public Health Service which assigned several of its applicants for post-graduate work to take the second course.

"We hope and believe that this enterprise under Dr. Rosenau's direction will expand into one of the most important

departments of public health education in the entire country. The need for special training for physicians who want to enter public health work is great. Efficient public health departments, National, State and local in modern conditions of living are an absolute necessity. There are large numbers of young physicians who with proper post-graduate training could make excellent health officers.

"The success of the new department at Chapel Hill will go a long way toward establishing an efficient system of public health work on a sound basis throughout the entire southeastern section of the country."

On February 1 of this year, funds from the Social Security Act became available to the State Board of Health through the Public Health Service and the Children's Bureau at Washington. In addition to adding a division of field training of public health nursing in connection with the new department of public health at the State University, a department of Public Health Dentistry was also established in connection with the Public Health School at Chapel Hill. This is said to be the first school of like character in the country. The County Health Department was enabled through the Social Security subsidy from Washington to aid all the whole time county health departments in an expansion of their work. The Division of Preventive Medicine employed Mrs. J. Henry Highsmith to begin work on February 20 as an Assistant in the field of health education. The work of this division, of course, took on enlarged activities. Plans were immediately set in motion to establish special county nurses in counties having no whole time health organization as special demonstration service for such counties. Plans were also launched to establish Maternity and Infancy Centers in many sections of the State as demonstration Centers, looking toward an eventual lowering of the infant and maternal death rates in this State.

A sum of \$17,500 of Social Security money was appropriated by the United States Public Health Service for the Division of Industrial Hygiene. Dr. M. T. Plyler was employed as an Assistant Medical Director in that division and Mr. C. R. Matheson as a Medical Technician. Both of these men had been employed on the staff of the North Carolina Tuberculosis Sanatorium. Up to the first of July more than 150 plants involving siliceous dust hazards had been surveyed. The entire asbestos textile industry in the state involving five plants had been studied, in cooperation with the United States Public Health Service, a granite cutting establishment investigation made, and a foundry study inaugurated. There were 525 asbestos textile workers and 46 granite cutters examined during the investigatory work. In addition, pre-employment examinations have been made of approximately 400 workers. All persons examined have X-ray films made of their chests. During this work nearly 300 atmospheric dust samples were analyzed.

During the period, the physician and the engineer attended a four weeks' special course on Industrial Hygiene given by the Public Health Service in Washington. The division has installed a complete office equipment, as well as portable equipment necessary for successful execution of this important work. The new division is housed in the basement of the State Board of Health Building.

On April 1 of this year, the State Board of Health established a service for crippled children. This followed the approval in late March of the North Carolina Plan for Crippled Children, prepared by the State Board of Health and submitted to the United States Children's Bureau. This plan was a prerequisite of the Children's Bureau toward participation by the State in the distribution of Social Security appropriations for this purpose. Dr. G. M. Cooper of the Division of Preventive Medicine was designated as Medical Director of this service, and Mr. J. T. Barnes was employed by the State Board as State Supervisor in charge of administrative duties of this service. An advisory committee representative of the Medical, Health, Welfare, and lay interest of the State in the problem of the crippled child was formulated to advise in the execution of this program. Prior to June 30, public clinics were arranged in various centers of the State under the direction of the State Board of Health. Cooperation had been arranged with the North Carolina Orthopedic Hospital and was being carried out satisfactorily.

Under the provision of the Children's Bureau regulations, an advisory committee was secured by the Director of the Division of Preventive Medicine for the purpose of advising from time to time on the general program of maternal and child health service work. This committee held its first meeting on March 27 at the State Board of Health in Raleigh. Representatives from the following organizations were present: State Medical Society, State Dental Society, State Public Health Officers Association, State Nurses Association, State Federation of Women's Clubs, State Parent-Teacher Association, State Welfare Department, Division of Pediatrics and Obstetrics of the State Medical Society. On or before June 30, the enlarged program of all the divisions of the State Board of Health was well underway.

- 1937 There was no event of outstanding importance occurring in the year 1937. Few changes in the staff or the sub-staff of the State Board of Health have occurred. Following the expansion of service throughout the year 1936 with the aid of Social Security funds coming through the United States Children's Bureau and the United States Public Health Service at Washington, a tremendous amount of work was done during the entire year 1937 in expanding the work of the health department throughout the State, an increased number of nurses were employed, additional county health departments

were established and more intensive efforts were made along all lines than in any previous year. The new School of Public Health Administration at the University of North Carolina under the direction of Dr. Milton J. Rosenau, aided materially by Doctor Carl V. Reynolds, State Health Officer, and the faculty of the Medical School of the State University, made substantial and satisfactory progress. An increasing number of sanitary engineers, sanitary inspectors, and health officers from this State and other states in the southeastern regional territory were trained at Chapel Hill.

An Advisory Committee of leaders in different organizations in North Carolina, including such organizations as the State Medical and Dental Societies, Public Health Association, Parent-Teacher organizations, Women's Clubs, and the State Nurses Association, together with some independent members of the medical profession in the field of pediatrics and obstetrics and orthopedic surgery, was organized and held its first satisfactory meeting during this year.

Dr. T. C. Worth joined the staff of the Division of Preventive Medicine on September 21, 1936, and served until April 15, 1937 in the capacity of assistant to Dr. Cooper. Dr. Worth aided materially in assisting in the organization of Maternity and Infancy Centers in some forty counties of the State and contributed a great deal toward strengthening the department work. Upon Dr. Worth's departure on April 15 to continue his postgraduate education in Boston, Dr. Roy Norton who had been with the Division of County Health Work for about a year and who was formerly health officer of Rocky Mount, succeeded Dr. Worth. Miss Mabel Patton, a qualified nurse, joined the staff of the Division of Preventive Medicine as a consultant nurse representing the Children's Bureau. Dr. W. J. Hughes, a colored physician whose services for work in the health education field in the Department of County Health Work was made possible through contribution by the Rosenwald Fund and who joined the staff on January 1, 1936, was able to achieve substantial progress in his work with the colored population of the State. This was the first time a colored physician had been admitted to membership on the sub-staff of the State Board of Health, and the results of work in 1936 and 1937 have fully justified his employment. Dr. R. L. Robinson joined the sub-staff of the Division of Industrial Hygiene on April 1, 1937, to succeed Dr. M. T. Plyler of that Division. Mr. W. H. Richardson, an experienced newspaperman who at one time was Secretary to Governor Morrison for his four years in the Governor's office, joined the Administrative Staff in the department exclusively conducted by the State Health Officer. Mr. Richardson has been a valuable addition to the staff and he has succeeded remarkably well in interpreting technical problems to the lay readers in hundreds of articles in the daily and weekly press of the State. Dr. G. M. Leiby, who had been Assistant District Health Officer in the Haywood-

Jackson-Swain District with headquarters at Bryson City, joined the sub-staff of the Department of Epidemiology in the fall of 1936 and after some field experience was sent to the Hopkins School of Public Health for a year's special studies in syphilology. Dr. F. S. Fellows of the United States Public Health Service was loaned to the State Board of Health as a consultant in the Department of Epidemiology in the field of venereal disease control. Miss Margaret Thompson, who holds a master's degree in home economics and nutrition work from the University of Iowa, joined the sub-staff of the Division of Preventive Medicine in October, 1937. On March 15, 1937, Miss Frances R. Pratt, a specially trained nurse under the auspices of the State Maternal Health League, joined the sub-staff of the Division of Preventive Medicine. Miss Pratt's work was financed by an individual contribution from an outside agency. Her work has been to organize through the medical profession and the local health officers on a voluntary basis a system of contraceptive control work when based on medical needs. Her work has been very successful and it has been a welcome and needed addition to the staff work.

On December 16, 1937 following Legislative provision in the 1937 session of the Legislature, \$160,000 in bonds were sold for the purpose of building a new plant for the State Laboratory on the grounds adjacent to the present State Board of Health building on Caswell Square, Raleigh. A PWA grant of about \$130,000 additional was received and work on the buildings was expected to be completed within the year 1938. A farm of 280 acres on the Raleigh-Cary paved highway was purchased and provision made for farm buildings to care for the animals used in the production of vaccines and serums.

On December 17, a conference of Public Health Officers was called at Raleigh for the purpose of discussing and making decisions concerning various field work jointly affecting the State and local health departments. This conference was so successful that it was voted to make it an annual affair.

During the year a central general filing system was established and put into effect under the direct supervision of the State Health Officer and the Administrative Division of the Board of Health. This is proving to be a very satisfactory and progressive step.

Malaria was made a reportable disease and a malaria inspection and control unit was established in the Department of Epidemiology July 1, 1937. Effective also in 1937 was the new plan of the Division of Vital Statistics with reference to the notification of birth registration certificates to parents. Instead of waiting for a parent to write to the department to inquire if the birth has been reported and to send 50c for certificate, the plan was adopted of sending to each parent whose baby's birth was reported properly a small neat certificate of the baby's birth. This was through an arrangement with the Bureau of the Census of the United States Government. Frank-

ing privileges are allowed in this work. It simply informs parents that their babies' births have been properly recorded and the idea is through this method to reach many of those parents whose babies' birth have never been reported and get them to send in the reports.

There were no changes in the membership of the State Board of Health this year. All members whose term expired were re-elected by the State Medical Society or re-appointed by the Governor, for additional four year terms.

The total expenditures for the State Board of Health during the fiscal year ending June 30, 1937, were \$881,484.01. Of this amount \$287,747.04 was appropriated by the Legislature, \$191,943.85 was by the United States Children's Bureau, \$312,210.42 by the United States Public Health Service, and finally \$89,582.70 from fees received by the Laboratory in water taxes, etc., and other miscellaneous items.

1938 During 1938, the extension and consolidation of health work in all departments of the State Board of Health was further accomplished. This year two outstanding events may be recorded. First, the Zachary Smith Reynolds Foundation decided to donate its income from a fund of about seven million dollars to the State Board of Health to aid in a long time program of syphilis control. The initial donation from this fund by the officials of the foundation to Dr. Reynolds was a check of \$100,000. This philanthropy will bring to realization one of the finest dreams of Dr. Carl V. Reynolds, State Health Officer. It promises to enable the State Board of Health to accomplish in the near future some of the objectives that have sometimes seemed to be long years off. A long time before the Government began to realize its responsibility in the prevention of disease and the preservation of the health of its citizens as a means of bringing about better social and economic conditions and the promotion of human happiness, philanthropists such as Rockefeller lead the way. This gift of the Reynolds Foundation, however, affords the practical means of enabling the State Board of Health to organize in collaboration with the various city and county health departments of the State an effective system through which the venereal diseases may be eventually controlled in this State.

The other event in the same connection was the passage by the United States Congress early in 1938 of a bill known as the LaFollette-Bulwinkle Bill, sponsored and carried through the lower House of the United States Congress by Representative A. L. Bulwinkle of Gastonia who has long represented his district in the lower House of Congress. Through the provision of this bill the State was able to receive during the year about \$80,000 additional funds for work in syphilis control. The proceeds of these funds enable the State Board of Health to attack the ravages of syphilis even in the prenatal stages by treating syphilitic mothers early enough in preg-

nancy to prevent the birth of hopelessly syphilitic babies. It is probably a fact that the benefaction of the Smith Reynolds Foundation is the largest single gift for this particular purpose that has ever been made by any public or private organization in this country. The cause is not only a worthy but a pressing one. It takes money to control and eliminate such diseases as yellow fever, typhoid and syphilis.

The School of Public Health Administration of the State University at Chapel Hill has made such material progress that it became necessary on the first of September this year to employ an additional full time professor in that department. Dr. Roy Norton, who for the preceding fifteen months had been an assistant in the Division of Preventive Medicine where he has done excellent work, was persuaded to accept the professorship. The State Board of Health reluctantly agreed to Dr. Norton's transfer in view of the fact that the School of Public Health Administration is of such far reaching importance that it should have the services of the very best available talent in the medical profession of North Carolina. Dr. Norton is admirably equipped for this important work. There are now five full-time professors in this division of the University.

Under the persistent work of Dr. Reynolds a stationary exhibit has been erected in the large halls of the central building of the State Board of Health at Raleigh, an exhibit which is an education in itself. It demonstrates the work of all the departments. Some of the State's foremost artists were called into the work and the officials of the National Youth Administration provided a great deal of the actual work at little cost to the State Board of Health. It would pay any citizen of North Carolina who is interested in the State's progress to visit this exhibit sometime during the year.

With the exception of the loss of Dr. Norton, there have been few staff changes of importance. Dr. R. L. Robinson who came with the Industrial Hygiene Division as a field worker in April, resigned and returned to his home to engage in private practice on the first of August. Mr. C. D. King, Jr., an Industrial Hygiene man, came with the Board in the Industrial Hygiene Division on June 15 as an assistant to Mr. M. F. Trice. Dr. G. M. Leiby returned at the completion of his course in John Hopkins University and assumed his duties as field director of the syphilis control program. Dr. Fellows still remains with the Board and continues to render valuable assistance.

The officials and employees of the Department of Preventive Medicine were saddened this year on account of the death of two veteran nurses. Miss Katharine Livingston died on May 26 and Mrs. Margaret Sloan died on July 12. Both of these nurses had rendered valuable service in this Division for many years.

There were no expiration of terms of service of the membership of the State Board of Health this year, therefore no changes in personnel occurred.

In March, 1938, the Board received a report from a committee previously appointed to study pneumonia. The committee headed by Dr. H. B. Haywood of Raleigh as chairman, Dr. W. T. Rainey and G. G. Dixon from the Board, with Doctors Fred Hanes, C. T. Smith as consultants, and Dr. C. V. Reynolds ex-officio, made a full report. Arrangements were made through Dr. Hanes of the Duke Medical faculty for a special course to train local technicians which was largely attended.

An important piece of field work which met with widespread appreciation throughout the State this year was a series of 34 health institutes for teachers and principals of schools in as many places representing the State. Eight thousand teachers and principals attended these Institutes which were of a practical character. The Institutes were conducted under the joint auspices of the State Board of Health, State Department of Public Instruction and the Extension Service of the North Carolina State College. The officials who executed this piece of work were Dr. Roy Norton and Mrs. H. P. Guffy, nurse, of the State Board of Health, Miss Mary Thomas, nutrition specialist of the State College Extension Service, Mr. H. A. Perry and Mr. Charles E. Spencer of the State Department of Public Instruction. This work was under the general supervision of Doctors Reynolds and Cooper of the State Board of Health, and it was carried out under the health education division of the Board, and Dr. J. Henry Highsmith of the State Department of Public Instruction.

The total expenditures for the State Board of Health for the fiscal year ending June 30, 1938, were \$1,041,895.98. Of this amount \$353,953.55 was appropriated by the Legislature, \$226,297.57 by the United States Children's Bureau, \$337,914.39 by the United States Public Health Service, and \$123,730.47 from fees received by the Laboratory in water taxes, etc., and other miscellaneous items.

A detailed account of the organization work of each one of the divisions covering the activities of this biennium will be found in the pages to follow.

REPORT OF THE SECRETARY-TREASURER AND STATE HEALTH OFFICER

July 1, 1936—June 30, 1938

By CARL V. REYNOLDS, M.D.

Excerpts of the activities as recorded in Minutes:

At the quarterly meeting of the Board, September 24, 1936, the "Notification of Birth Registration" which was passed on at the last Board meeting was discussed. Motion was passed "that under Dr. R. T. Stimpson's, Special Agent, signature, the Board be identified by the words "North Carolina State Board of Health."

The Secretary discussed requirements of sanitary rules and regulations as pertain to circuses, carnivals, and fairs. Also, according to request of Mr. R. G. Deyton, Assistant Director of the Budget, a motion was passed to transmit a letter to Mr. Deyton confirming specific rules and regulations concerning sanitation of the State Fair.

The Board adopted a resolution to approve the textbook, "Alcohol and the Habit Forming Drugs" by Grant L. Donnelly, relating to the effects of alcohol and narcotics on the human system. This is a textbook to be used in the public schools.

A motion was passed at this meeting that shellfish dealers be required to meet requirements of the Division of Sanitary Engineering. Also that oysters of Grade A be washed before shucked.

Other discussions were made regarding activities of the maternity and infancy program centers as a demonstrative piece of work; a course in public health dentistry; plan and set-up of mouth health teaching in the schools of North Carolina, as well as activities of the various divisions of the State Board of Health.

On January 26, 1937, the Board met in regular quarterly session. Again, the "Notification of Birth Registration" blanks were discussed and the Secretary informed the Board that we could not invalidate the franking privilege, hence it was necessary to insert the wording "The State Board of Health, Raleigh, North Carolina." Consequently, motion was adopted to accept the above in lieu of the rule made at the September 24, 1936 meeting.

At this meeting the Board adopted a regulation that local health officers may "degrade" any cafe or hotel when inspection shows that same should be "degraded," and when future inspection showed that the Grade of said cafe or hotel should be "re-instated," not higher than the Grade removed, that the Health Officer should be authorized so to do.

The Secretary discussed the feasibility of withdrawing funds from county health departments that persisted in not complying with county contracts, rules and regulations of the State Board of Health. The general consensus was that this was a very good idea, and that not only the health officer should be notified but that the Chairman of the

County Board of Commissioners also should be advised of the withdrawal of funds when such action was necessary.

A report of the work being done by Dr. G. M. Leiby, who has been connected with the Board of Health since October 1, 1936, was discussed. Doctor Leiby is doing full-time work in the venereal disease program, giving illustrated lectures in clubs, schools, and public meetings.

Dr. J. C. Knox, Director of the Division of Epidemiology, who is also Chairman of the Committee on Venereal Disease Control, gave a full report of the meeting held in Raleigh on December 14, 1936. He made also a report on the visit of Dr. W. F. Snow of the American Social Hygiene Association to this State. Motion was passed to send a copy of the "Suggestions for Changes and Inclusions in Rules and Regulations for Venereal Disease" to all members of the Board in order that they might study the changes very carefully and take them up at the next Board meeting.

Due to the fact that it is almost impossible to secure capable school dentists for only eight months of the year, the following resolution was adopted:

"BE IT FURTHER RESOLVED, That no County Health Department shall receive a maximum of State or Federal Aid unless said County provides funds for a Mouth Health Program to be approved by the Division of Oral Hygiene.

"BE IT FURTHER RESOLVED, That inasmuch as the State Board of Health is helping to defray the expense of the Mouth Health Programs, a part of the Program in a County will be done during the summer, or when schools are closed, this time not to exceed four weeks of dental service in a twenty weeks' program, and that the Health Officer of the County will be requested and expected to cooperate with this in view. It is understood that the same applies in all counties and, in such counties as do not have full-time health officers, that the County Superintendent of Schools will assist in carrying out our program."

At this meeting, and in compliance with Sections 7088(a) and 7089(a) of Public Health Laws, and since Hertford County has a whole-time county health officer, it was deemed wise that Hertford County should be consolidated for purposes of registration of births and deaths, and the whole-time health officer of Hertford County be made registrar of said county. This motion adopted.

At this quarterly meeting a resolution was enacted that the Secretary of the Board confer with the Governor relative to preliminary organization, with power to act, regarding plans and outlines such as provided by State and Provincial Health Officers, and also The Disaster Committee on Sanitary Engineering Section of American Public Health Association.

The annual meeting of the Board was held at Winston-Salem, N. C., May 5, 1937. At this time Dr. Carl V. Reynolds, Secretary and State Health Officer, submitted his annual report to the Board, also a paper on a special subject: "Syphilis and Its Control in North Carolina." The plan and methods of control set forth in the paper were unanimously approved by the members of the Society at the Conjoint Session.

At this meeting a regulation was passed that "Board Policies for Allocation of Funds to Counties for Health Work" be referred to the Executive Committee, with power to act.

The Secretary presented to the Board the advisability of securing the services of an "Informational Representative." The plan was approved and orders given that the services of such a publicity agent be secured.

A motion was passed unanimously to adopt Rules and Regulations recommended by Doctor W. F. Snow of the American Social Hygiene Association, for the program on control of syphilis in North Carolina.

The Secretary presented "Regulations Governing the Impounding and Maintenance of Impounded Waters in North Carolina" with particular reference to malaria control, together with a letter from the Attorney General dated February 20, 1937, re: Public Health; control of preventable diseases; report relating to the authority of the Board to pass such regulations.

At the May 5, 1937, Board meeting, malaria fever was made a reportable disease.

A Committee was appointed to study pneumonia.

The Board was informed that Dr. M. T. Plyler, Assistant to Doctor Eason in the Industrial Hygiene Division, was resigning without prejudice, and that Dr. R. L. Robinson would be appointed to take his place.

There was a called Executive Committee meeting of the Board held June 2, 1937. An amendment was presented to request the allocation of a grant instead of a loan and grant to aid in financing the construction of a new Central Laboratory Building and a Laboratory Farm for the State Laboratory of Hygiene. Also the possibility of securing a farm to be known as the "State Laboratory Farm" was discussed. The amendment to the Application to the U. S. Federal Emergency Administration of Public Works was passed unanimously to finance the construction of a new plant for the State Laboratory of Hygiene. The Executive Committee also met with the Highway Commission in regard to a farm location. A motion was unanimously carried that the Chairman and two members of the Commission be requested to investigate the proposal, with power to act.

A regular quarterly meeting of the Board was held October 21, 1937. The Secretary informed the Board that a farm had been bought on the Cary Highway of about 270 acres for the amount of \$8,500, this to be designated as the "State Laboratory of Hygiene Farm." He also discussed the bond issue of \$160,000 but stated that the resolutions were not quite ready for approval.

A delegation of the N. C. State Burial Association were present at this meeting and presented their plea for representation on the State Board of Embalmers in lieu of the nomination coming from the N. C. Funeral Directors Association. The Board decided that it was time to have a policy, not only for this group, but for any other that may come up from time to time. Hence, a motion was adopted that the Board, as a matter of policy, get away from accepting the recommendations of one man for appointment to the Embalming Board, or any Board. And, in lieu of one nomination, that the Secretary ask all

interested organizations to furnish the State Board of Health with a list of approved candidates, not to exceed five in number, which would be suitable to select a nominee from. A motion was enacted that the Secretary communicate with the North Carolina Funeral Directors and the North Carolina Burial Association, informing them of the new policy of the Board and request them to submit names of five candidates for the State Board of Health's approval. In addition, the Executive Committee was given authority to select one man for the next appointment.

After much discussion regarding the short lunch hour allotted to school children; the alarming increase in degenerative diseases among the present generation, and the acknowledgment that these degenerative diseases come on, more or less, on account of irregularity in eating habits, that the school children need much longer time for lunch period. A motion was adopted that the Secretary take the matter up with Superintendent Clyde A. Erwin and Dr. J. Henry Highsmith, and report back to the Board.

At this meeting the Board approved the Sanitary Rules Governing Barbers and Barber Shops and Barber Schools and Colleges in the State of North Carolina. The Secretary of the Barber Board was so advised. The State Board of Health assumes no responsibility for the enforcement of these rules and regulations.

At the October 21, 1937 meeting, Board Policies as to allocations of funds to the various whole-time County Health Departments were presented. A motion was adopted to the effect that the changes in Board policies in appropriating funds for County Aid be made from a percentage basis to the dollar basis as outlined. Doctor Large wished to be recorded as opposing the change from percentage basis to dollar basis for County Aid.

By special request, Franklin County was allocated \$1,260 instead of the present maximum allotment of \$1,152, but this appropriation was to be kept in effect only through this fiscal year.

At this meeting the Board discussed mileage allowance for employees in local health units and the following mileage allowance was enacted: "\$50.00 per month travel allowance will be paid provided there is as much as 800 miles travel per month, average for the year. Travel less than 800 miles per month will be paid for at the rate of 6c per mile."

At the October 21, 1937 meeting, permission was asked to allow the blind to have a stand within the Health Building for the sale of soft drinks, etc. Motion was unanimously passed that this would be an improper use of the Building and declined the request.

Upon petition from the County Board of Commissioners, the whole-time health officer, and the County Board of Health, motion was made, and carried unanimously, that Edgecombe County be consolidated as to a vital statistics registration district, and that the whole-time health officer of Edgecombe County be made registrar for said county.

At this meeting the following committee was appointed to study pneumonia:—Dr. Hubert B. Haywood, Chmn.; Dr. W. T. Rainey; Dr.

G. G. Dixon. Consultants, Dr. Fred Hanes, Prof. of Medicine, Duke University, Durham; Dr. C. T. Smith, Park View Hospital, Rocky Mount, and Dr. Carl V. Reynolds, ex-officio.

A special called meeting of the Board of Health was held December 16, 1937, to consider and adopt proposals of the bonds for revenue for the construction of the State Laboratory of Hygiene which were offered for sale by the State Treasurer at 12:00 o'clock noon, December 16, 1937. The firm of Lewis & Hall were the successful purchasers. Amount of bid was \$160,017.00; rate of interest $4\frac{1}{2}\%$. The resolution was adopted unanimously.

Also the Secretary read a resolution which was an opinion, dated June 7, 1937, from the Attorney General, A. A. F. Seawell, authorizing the State Board of Health to purchase the farm and pay additional funds for legal services, taxes, etc., and that said purchase could be paid from the proceeds derived from the sale of State Laboratory Revenue bonds. Motion was made to adopt the resolution, which was seconded, and unanimously carried.

At this meeting upon recommendation of the American Dental Association Vincent's infection was made a reportable disease.

Again, at the December 16, 1937 meeting, the Secretary took up the matter of travel allowance for employees in local health units. There being quite a deal of dissatisfaction among the local health departments, the Board was asked to reconsider the motion passed at the October 21, 1936 meeting. It was deemed best to rescind the motion passed at the October meeting and in lieu thereof a new motion was made as follows:— that the depreciation of cars be made \$25.00 per month and with an earned travel on each mile travelled at the rate of three cents per mile, not to exceed the amount budgeted within a given year. This motion was seconded and carried.

Also at this meeting a copy of "A Standard Plan for Malaria Control in North Carolina" was given to each member of the Board who was asked to read and write in expressing approval or disapproval.

The Secretary gave a brief but confidential statement to the Board of the gift from the Z. Smith Reynolds Foundation, Inc., Winston-Salem, N. C., through its trustees, of \$100,000 to the State of North Carolina, for the cure and control of syphilis, to be spent during the current year in specified districts. It is also intended that this Fund be used over a long period, possibly fifteen years, in order to aid in eradicating syphilis in North Carolina. It was moved and seconded that Dr. G. G. Dixon be asked to prepare resolutions of appreciation and thanks to the Reynolds Foundation on behalf of the N. C. State Board of Health for this generous gift for syphilis control. Motion carried unanimously.

The regular quarterly meeting of the State Board of Health was held Thursday, March 17, 1938. The Secretary discussed with the Board the cooperation between the State Department of Public Instruction, the Extension Division of State College, and the State Board of Health for collaborating in a plan for school health supervision with the public school teachers of the State; and, reported that school institutes

are being conducted, beginning March 10th. Teachers are requested to attend the meeting; round table discussions are conducted by representatives of the above named departments, and, that this course of lectures now being carried on as experiments, it was hoped, eventually would become a forward step in the study of the prevention of disease and the preservation of health among the school population.

A delegation from the N. C. Funeral Directors and Embalmers Association were heard in regard to a member of their Association being approved for a period of five years to the N. C. Funeral Directors and Embalmers Association. The committee presented their views to the Board, stating that there was no ill-feeling entering into the controversy with the N. C. State Burial Association, (which had been heard at a previous meeting of the Board) but that the State Funeral Directors & Embalmers were a member of, and recognized by the National Association—that the Burial Association was an Association which pertains to insurance, etc. It was moved and seconded that the Board consider this matter in executive session, therefore the delegation from the Funeral Directors & Embalmers retired. Motion was made, seconded, and carried to rescind the original action of the Board taken October 21, 1937, and in lieu thereof the following motion was made, seconded, and carried: That the N. C. Funeral Directors and Embalmers Association suggest to the N. C. State Board of Health, at their May meeting, ten names from their membership from which the Board may select two men to be appointed to the Board of Elbalmers Association, the term of one to expire in 1942 and the other in 1943. Also motion was made and seconded to endorse the nominees of the N. C. Funeral Directors & Embalmers Association. After discussion, the motion tied and the President of the Board was called upon to cast a deciding ballot which carried the motion.

At this meeting a motion was made that the Secretary make an effort, in the 1939 General Assembly, to eliminate from the statutes the provision that the members of the State Board of Examiners and Embalmers be approved by the N. C. State Board of Health. The motion was seconded, and carried unanimously.

Dr. John H. Hamilton, Director of the Division of Laboratories, appeared before the Board and presented plans and specifications for the laboratory and barn to be erected on the farm of the State Laboratory of Hygiene. He went into detail as to the approximate cost of all the buildings, such as small laboratory; horse barn, water supply, etc. A resolution was adopted that the Board adopt plans and specifications as submitted by Doctor Hamilton.

It was at the March 17, 1938, meeting of the Board that the Secretary presented the agreement or resolution of the "Administrative Program of Venereal Disease Control and Agreement of Participation for the North Carolina State Board of Health Operating in Cooperation with Local Health Departments, Through the Utilization of Funds Made Available by the Z. Smith Reynolds Foundation, Incorporated," and the "Administrative Program of Venereal Disease Control and Agreement of Participation for the North Carolina State

Board of Health in Cooperation with Local Health Departments." These resolutions had been previously studied by the Board members, and after a few changes in both sets of resolutions, a motion was adopted to approve them with the corrections.

Each member of the Board was presented with a copy of "Rules and Regulations Governing the Sanitation of Abattoirs" and with a copy of "Rules and Regulations Governing the Sanitation of Meat Markets," with the request that they read them carefully and send in their approval or disapproval of same.

The pneumonia control activities and the technicians trained to type pneumonia, were discussed at length, and at the suggestion of Doctor Haywood, Chairman of the Commission for the Study and Control of Pneumonia, a motion was made that a special bulletin concerning Pneumonia, and the list of technicians be printed. The motion was amended by stating that a copy of this bulletin be supplied to each physician in the State. The motion was adopted.

The quarterly meeting of the Board of Health was held at Pinehurst, N. C., May 4, 1938. An addition was made to the Minutes of the March 17, 1938, meeting, to be inserted following the "Motion made by Doctor Large that the Board adopt plan and specifications as submitted by Doctor Hamilton" as follows: Motion made that the Executive Committee be authorized to let contract after bids had been canvassed. The motion was seconded, and carried unanimously.

Motion was made that the "Rules and Regulations Governing the Sanitation of Abattoirs" and "Rules and Regulations Governing the Sanitation of Meat Markets" be approved, with the request that Doctor Reynolds and Mr. Booker look into the feasibility of the rat-proofing of these establishments. The motion was adopted.

At the May 4, 1938 meeting the Board passed a motion unanimously to approve a letter to the Trustees of the Z. Smith Reynolds Foundation, Incorporated, written December 16, 1937. Following is copy:

"To the Trustees of the Z. Smith Reynolds Foundation, Inc.:

In the course of human events, we must often stand by, in the face of a deep but helpless concern, and see suffering, even death, harass and strike down our fellow beings. Happily, we have advanced a long way in the direction of both preventive and curative medicine. But we are told that "earth hath its price for what earth gives us," meaning, in this connection, that the remedy is not always within the financial reach of those who need it and to whom it should be supplied.

Great philanthropies have blazed the way for research, resulting in the discovery of preventive and curative methods; these philanthropies stand out as beacon lights along the road of human endeavor.

From the Z. Smith Reynolds Foundation, Incorporated, there has just been made available for the war on syphilis in North Carolina the sum of \$100,000, to be administered through the State Board of Health.

It is with sincere appreciation that the Directors of this Board give voice to our gratitude for this significant benefaction, which we do at this, a called meeting, held on the 16th day of December, 1937.

With this money, we will be able to realize one of our fondest dreams. We wish to go on record as expressing not only the thanks

of the State Board of Health, but also the gratitude of all the people of North Carolina—those afflicted with this terrible disease and those who, although they are free from it, would rid our Commonwealth of this social insecurity which will remain as long as it is prevalent.

We, the committee named to tender you this expression, heartily concur in the above as reflecting the sentiment of the Board.

Signed: DR. G. G. DIXON, *Chairman*
DR. S. D. CRAIG, *President*
DR. J. N. JOHNSON, *Vice-President*
DR. CARL V. REYNOLDS, *Sec-Treas.*
and State Health Officer."

There was a special called meeting of the Board June 29, 1938, for the purpose of considering the offer of the United States (Federal Government through the PWA) to aid by way of grant in financing the construction of buildings for the State Laboratory of Hygiene. After detailed information, motion was made, seconded and carried unanimously that the State Board of Health accept the offer of the United States to the N. C. State Board of Health to aid by way of grant in financing the construction of buildings for the State Laboratory of Hygiene.

Motion was made, seconded and carried unanimously to appoint the following members on the "Building Committee": Dr. Hubert B. Haywood, Chairman; Dr. S. D. Craig, and Dr. H. G. Baity.

The Laboratory of Hygiene's problem was presented to the Board at the June 29, 1938 meeting as to the question of specimen containers as to whether or not the Board would continue to distribute them free, or charge actual cost. The laboratory operates on a budget and the demand is so great, and there is such a waste in containers, etc. for specimen, and with the increased volume of business and expenditures, the Laboratory needed an increase in receipts, or an increased budget. Motion was made, seconded, and carried unanimously, that beginning July 1, 1938, the State Laboratory of Hygiene charge cost for all specimen containers.

The Secretary presented to the Board, at this meeting, a concise summary of the venereal disease control program in the State under the Z. Smith Reynolds Foundation Fund to date. Also a report as to the status of the Federal allotment to be used for venereal disease control.

INFORMATIONAL SERVICE REPORT

Through the office of the Informational Representative, who assumed his duties on May 1, 1937, routine news releases, feature articles and other information are given out for publication, each such article being sent to every newspaper in North Carolina, except in cases where the material was worked up at the special request of some individual newspaper or news-gatherer. Before any article is released for publication, it is carefully checked for accuracy and to eliminate any sensational or misleading features.

Through the generosity of the publishers of North Carolina, nearly seventy-five papers are received through the office of the Informational Representative, at no cost to the State Board of Health, such papers being sent on a cooperative basis by the publishers who have given this publicity work their one hundred percent cooperation, as evidenced by the fact that, between May 1, 1937, and June 30, 1938, clippings covered 185 pages in the large scrapbook which is being kept as a part of the permanent records of the State Board of Health in order that a daily history of this Board, as chronicled in the press, be available to those who, in future years, seek to learn something of present activities.

SYPHILIS AND ITS CONTROL IN NORTH CAROLINA

By CARL V. REYNOLDS, M.D.,
Secretary and State Health Officer

[Paper presented to N. C. State Medical Society at Winston-Salem,
May 4, 1938]

Time moves on and one must keep pace and in step.

Changes are constantly being submitted, advances and mistakes are being made.

We must know the past to appreciate the present and to prepare intelligently for the future.

As time moved in our field of endeavor advances are well exemplified in pace in the elimination of smallpox, plague, typhoid fever, dysentery, hookworm, tuberculosis, etc.

Syphilis, "The King of Killers," "The Exterminator," "The Great Imitator," "The Ventriloquist," is a shining example of the failure to keep in step with progress, and history may well record our lethargy in seriously attacking a disease so devastating, yet with a known cause and known specific. It is controllable and it is curable. It is, however, distinctly encouraging that the name "syphilis" is no longer taboo, unspoken and unread. It is distinctly encouraging that the laity is fast becoming cognizant of its dangers, and the proper methods of control and treatment. It is encouraging that now history teaches us, and statistics clearly establishes the fact that syphilis is not controlled as a moral issue. It is encouraging to note that syphilis is treated now as an infectious disease, contracted by and through many avenues—the violation of the moral law is one source only. We are not now attempting to hold the disease within the immoral group, but admit that it attacks the moral and immoral alike.

Syphilis, the one outstanding disease that challenges the ingenuity of the medical profession and the public health officials looms up before us. What are we to do about it?

May I present to you, for your consideration, a plan for the control of syphilis set up at a Conference of State and Territorial Health Officers in Washington, D. C., April 7th and 8th, 1937. And, in this plan there will appear many suggestions that are the outcome of conferences held in our State Health Department and with a Committee appointed by the President of the North Carolina State Medical Society for the special consideration of a syphilis program.

The members of the Conference of the State and Territorial Health Officers, appreciating the great incidence and prevalence of syphilis and the possibility that this disease may be controlled through the application of modern knowledge, endorse the following public health principles and urge that they be applied by health departments in cooperation with the medical profession throughout the United States:

1. Administration of the Program

The Health Department of the State of North Carolina includes the provisions in its administrative organization as outlined by the State and Territorial Health Officers in that syphilis control work is integrated with the communicable disease division.

2. The program is directed by a full-time venereal disease control officer.

3. There is a local health advisory committee to the Health Department out of a selected group from the North Carolina Medical Society.

The State Health Department should establish a system of granting aid to cities in which health officers agree to carry on a syphilis control program approved by the State Department of Health. The standards to be maintained if approval is granted, cover all of the features of the program such as those pertaining to diagnostic facilities, treatment facilities, epidemiological work and the educational program.

Functional control program includes the following:

"I. The Provision of Adequate Diagnostic Facilities

Adequate and universally available laboratory service for dark-field examinations and serologic tests is a first essential in the control of syphilis. While it is not deemed feasible or advisable to restrict the performance of the blood serologic tests to a central State Laboratory, it is believed to be sound public policy for the State to set standards for the performance of such tests, to control their accuracy, their continued specificity and sensitivity, and to see that conditions are maintained which are essential for accurate technic in serodiagnostic work. For this reason, in addition to the fullest possible development of State laboratory facilities to supplement existing private facilities, it is recommended that a system of State licensure or approval for hospital, institutional, and other private laboratories doing bacteriologic, serologic, and other work of importance to public health be organized. The possibility should be borne in mind that under certain circumstances local private laboratories may be subsidized to advantage for the performance of laboratory work."

"State health departments should also aim to place at the disposal of every interested private physician or clinical group (a) the direct dark-field examination of secretions by a properly equipped laboratory administered as described above; and (b) *indirect dark-field examinations (capillary-tube method)* are made at the State laboratory." This service is available to every physician in North Carolina. Early diagnosis is most important.

"Studies conducted by the Public Health Service in the serodiagnosis of syphilis indicate the urgent need for periodic comparative evaluation of the performance of serodiagnostic tests for syphilis in all laboratories. Directors of laboratories performing such tests should have and should avail themselves of the opportunity of comparing their results with those of well qualified serologists in other laboratories performing the same tests on comparable samples from known syphilitics and

presumably nonsyphilitic individuals. It is recommended that the system of comparative examination of serodiagnostic tests be continued to be extended annually to all State laboratories by the United States Public Health Service. In turn State laboratories themselves, if the performance of efficient serodiagnostic tests for syphilis within the several States is to be assured, should offer a similar opportunity to local laboratories.

"An efficient serodiagnostic test for syphilis should possess a specificity rating of 100 per cent. Any test which yields even one per cent of false positive reactions should be so modified as to increase its specificity even with some slight sacrifice of sensitivity. The efficient serologic test for syphilis should also be sufficiently sensitive to detect at least two-thirds of the patients who have latent syphilis without regard to the previous administration of treatment." All of the thirteen tests in the first serodiagnostic study gave presumably false positive reactions on patients having malaria.

II. Development of Treatment Facilities

"The necessity for applying treatment in the control of syphilis makes the provision of adequate treatment facilities a measure of the utmost importance in the campaign.

"The Committee agreed that clinic service and consultative advice and opinion should be available in urban areas for (a) the diagnosis and treatment of any patient who applies or is referred by a private physician, when necessary to protect the public health or the patient is unable to pay; and (b) any patient who is unable to afford private medical care.

"No conflict between clinic and the physician in private practice need be feared with these restrictions, since the planning and development of these activities demand the closest continuous cooperation between the county, local and State medical societies and the health authorities, and since experience has shown that the patient able to pay for private medical care will not submit to the comparative inconvenience, delay and public exposure of clinic attendance."

"The major emphasis of the treatment program should be placed on the patient with infectious early syphilis, with the primary aim of reduction in the incidence of the disease. Late syphilis cannot be neglected, for humanitarian and, still more important, for economic reasons, but many clinics and physicians will find more time to care for the early syphilis case load if an organized effort is made to discontinue service for the overtreated patient with latent or late syphilis."

"In rural communities adequate treatment facilities for indigent patients may be achieved: (a) By subsidizing properly qualified local physicians; (b) by county health officers themselves, provided these health officers have had proper training in the clinical management of syphilis; (c) by subsidies to counties or communities for the transportation of patients to the nearest center at which approved treatment may be obtained; (d) by the establishment of special treatment

center in rural communities in which large numbers of negroes are included in the population and in which it is desirable because of unusually high prevalence to supplement the efforts of local physicians; and (e) possibly by the development of a traveling health unit in which the necessary measures may be instituted for the prevention of the communicable diseases, including treatment of the venereal diseases."

"For the treatment of early syphilis, syphilis in pregnancy and latent syphilis the standards which have been set up by the Co-operative Clinical Group in co-operation with the United States Public Health Service are recommended for application throughout the country. The treatment of patients with late syphilis is a problem peculiar to each case. In late syphilis treatment cannot be standardized."

"In providing for transient and transferred patients, the original clinic should give all patients a statement or record of treatment received, as a factor in promoting the continuity of therapy. It is further recommended that an effort be made to cooperate in maintaining the continuity of the treatment schedules of patients who desire to return periodically to the care of their practitioners; that when their schedules appear faulty an effort be made to secure the cooperation of the practitioner in making recommended changes; and that failing such cooperation the treatment of the patient shall be continued in accordance with accepted public health standards."

III. Application of Epidemiological Principles

"Each early case of syphilis should be investigated, the investigation to include a careful attempt to identify and locate the source of infection, as well as contacts prior and subsequent to infection, and to place such individuals as required under observation and treatment.

"Case and contact investigations, although often difficult undertakings, are valuable case finding procedures and fully justify the labor and expense involved in making them. Analysis of the results of such investigations, as well as other epidemiologic studies, are greatly needed to add to existing knowledge of the disease. The physician in private practice should be urged to attempt to determine the sources of infection of early cases coming to his attention, and to encourage the bringing in of contacts for examination. It is felt, however, that efforts of the physician in this direction must in most instances be supplemented by official action. As syphilis constitutes a public health problem the rights of the community supersede the rights of the individual. This disease knows no class distinction. The same fundamental principles of control apply to the patients under the care of private physicians or public clinics. The application of case holding measures in lapsing patients is also of great importance. Forcible isolation may rarely be necessary for recalcitrant individuals.

"Syphilis reporting should not be limited to the notification of early and potentially infectious cases. There is no limitation as to the stage of the disease or the duration of infection with which public health

officials are concerned. It is highly desirable that a standard report form be developed suitable for nation-wide use.

IV. Assistance to the Private Physician

"Health departments may be of assistance to private physicians through the provision of the following services to them:

- "1. Free laboratory service.
- "2. Free drugs for the treatment of syphilis which shall have passed accepted standards of effectiveness.
- "3. Simple appropriate epidemiologic and morbidity reporting systems including forms which shall carry free mailing service.
- "4. Facilities for the hospitalization of their indigent and infectious patients who may require such care.
- "5. Other special assistance to advance the participation of the private physician in scientific and educational work."

V. Legislation

Exhibit A:

An Act for Prevention of Venereal Diseases

The General Assembly of North Carolina do enact:

Section 1. That syphilis, gonorrhea, and chancroid, hereinafter designated as venereal diseases, are hereby declared to be contagious, infectious, communicable, and dangerous to the public health. It shall be unlawful for any one infected with these diseases or any of them to expose another person to infection.

Sec. 2. Any physician or other person who make a diagnosis in or treats a case of venereal disease, and any superintendent or manager of a hospital, dispensary, or charitable or penal institution in which there is a case of venereal disease, shall make a report of such case to the health authorities according to such form and manner as the North Carolina State Board of Health shall direct.

Sec. 3. State, county, and municipal health officers, or their authorized deputies, within their respective jurisdictions are hereby directed and empowered, when in their judgment it is necessary to protect the public health, to make examinations of persons reasonably suspected of being infected with venereal disease, and to detain such persons until the results of such examinations are known; to require persons infected with venereal disease to report for treatment to a reputable physician and continue treatment until cured or to submit to treatment provided at public expense until cured; and also, when in their judgment it is necessary to protect the public health, to isolate or quarantine persons infected with venereal disease. It shall be the duty of all local and State health officers to investigate sources of infection of venereal disease, to cooperate with the proper officials whose duty it is to enforce laws directed against prostitution, and otherwise to use every proper means for the repression of prostitution.

Sec. 4. All persons who shall be confined or imprisoned in any State, county, or city prison in the State shall be examined for and, if

infected, treated for venereal diseases by the health authorities or their deputies. The prison authorities of any State, county, or city prison are directed to make available to the health authorities such portion of any State, county, or city prison as may be necessary for a clinic or hospital wherein all persons who may be confined or imprisoned in any such prison and who are infected with venereal disease, and all such persons who are suffering with venereal disease at the time of the expiration of their terms of imprisonment; and, in case no other suitable place for isolation or quarantine is available, such other persons as may be isolated or quarantined under the provisions of section three, shall be isolated and treated at public expense until cured; or, in lieu of such isolation any of such persons may, in the discretion of the North Carolina State Board of Health, be required to report for treatment to a licensed physician or submit to treatment provided at public expense as provided in section three. Nothing herein contained shall be construed to interfere with the service of any sentence imposed by a court as a punishment for the commission of crime.

Sec. 5. The North Carolina State Board of Health is hereby empowered and directed to make such rules and regulations as shall in its judgment be necessary for the carrying out of the provisions of this act, including rules and regulations providing for the control and treatment of persons isolated or quarantined under the provisions of section three, and such other rules and regulations, not in conflict with provisions of this act, concerning the control of venereal diseases, and concerning the care, treatment, and quarantine of persons infected therewith, as it may from time to time deem advisable. All such rules and regulations so made shall be of force and binding upon all county and municipal health officers and other persons affected by this act, and shall have the force and effect of law.

Sec. 6. The North Carolina State Board of Health, through its officers, are hereby empowered and authorized to incur such expenses in the examination, detention, quarantine, and treatment of persons suspected of having, or having venereal diseases as in their judgment is necessary.

Sec. 7. The North Carolina State Board of Health shall submit to the county commissioners of the county in which persons suspected of having, or having, venereal disease, or suspected of having spread the disease, an itemized statement of expenses incurred in the examination, detention, quarantine, or treatment of such persons, and the county commissioners shall, within thirty days after the receipt of such statement of expenses, pay to the treasurer of the North Carolina State Board of Health a sum equal to that expended.

Sec. 8. Any person who shall violate any of the provisions of this act or any lawful rule or regulation made by the North Carolina State Board of Health pursuant to the authority herein granted, or who shall fail or refuse to obey any lawful order issued by any State, county, or municipal health officer, pursuant to the authority granted

in this act shall be deemed guilty of a misdemeanor, and shall be punished by a fine of not less than twenty-five dollars, nor more than fifty dollars, or by imprisonment for not more than thirty days.

Sec. 9. All laws or parts of laws in conflict with the provisions of this act be and the same are hereby repealed.

Sec. 10. This act shall be in force from and after its ratification.

Ratified this 10th day of March, A. D., 1919.

Exhibit B:

"An Act Requiring the Examination of Domestic Servants"

The General Assembly of North Carolina do enact:

Section 1. That hereafter all domestic servants who shall present themselves for employment shall furnish their employer with a certificate from a practicing physician or the public health officer of the county in which they reside, certifying that they have been examined within two weeks prior to the time of said presentation of said certificate, that they are free from all contagious, infectious or communicable diseases and showing the non-existence of any venereal disease which might be transmitted. Such certificate shall be accompanied by the original report from a laboratory approved by the State Board of Health for making such tests showing that the Wassermann or any other approved tests of this nature are negative. Such tests to have been made within two weeks of the time of the presentation of such certificates; and such certificate shall also affirmatively state the non-existence of tuberculosis in the infectious state.

Sec. 2. That all domestic servants employed shall be examined at least once each year and as often as the employer may require, and upon examination shall furnish to the employer all of the evidence of the condition of their health, as is set out in section one hereof.

Sec. 3. All laws and clauses of laws in conflict with this act are hereby repealed.

Sec. 4. That this act shall be in full force and effect from and after its ratification.

In the General Assembly read three times and ratified, this the 22nd day of March, 1937.

W. P. HORTON,

President of the Senate.

R. G. CHERRY,

Speaker of the House of Representatives."

Exhibit C:

"A Bill to Be Entitled 'An Act to Regulate Marriage With Respect to Venereal Disease, Tuberculosis, and Imbecility'."

The General Assembly of North Carolina do enact:

Section 1. Article 2 of the Consolidated Statutes, relating to marriage license, is hereby amended by inserting after Section 2500 additional sections as follows:

"2500 (a). No license to marry shall be issued by the Register of Deeds of any county to a male or female applicant therefor except upon presentation by the said applicants of a certificate executed within seven days from the time of the presentation of said certificate to the Register of Deeds as hereinafter provided, showing the non-existence of any venereal disease which might be transmitted. Such certificate shall be accompanied by the original report from a laboratory approved by the State Board of Health for making such tests showing that the Wassermann or any other approved test of this nature is negative, such tests to have been made within two weeks of the time application is made for license, and such certificate also to state the non-existence of tuberculosis in the infectious state and that the applicant has not been adjudged by any court of competent jurisdiction an idiot, imbecile, or of unsound mind. Exceptions to this are permissible only under the conditions hereinafter named:

"(1). When the Wassermann or other approved tests are positive certificates may be issued and licenses granted *only* when both applicants are more than fifty (50) years of age and when both applicants sign an agreement to place themselves under competent medical treatment and supervision and to continue such treatment until cured of this disease:

"(2). When one or both applicants are less than fifty (50) years of age, and Wassermann or other approved tests are positive, certificates may be issued and licenses granted *only* when in the opinion of a regularly licensed physician sufficient treatment has been given to render either or both applicants incapable of transmitting this disease to others, and *only* when said applicants agree to continue treatment until discharged by the regularly licensed physician in charge of such treatment, as cured of the disease.

"(3). If either applicant has been adjudged by a court of competent jurisdiction an idiot, imbecile, or of unsound mind, license to marry shall be granted irrespective of the reaction of the Wassermann test or other approved tests only after eugenic sterilization has been performed on the female applicant, in accordance with State laws governing eugenical sterilization."

"2500 (b). *Certificate Executed by What Physicians.*—That such certificate shall be executed by any reputable physician licensed to practice medicine and surgery in the State of North Carolina whose duty it shall be to examine such applicants and issue such certificate. Certificates without charge may be obtained from the County Health Officer if applicants are unable to pay for examination."

Sec. 2. All laws and clauses of laws in conflict herewith are hereby repealed.

Sec. 3. This act shall be in full force and effect from and after its ratification.

Note: The above bill failed to pass the N. C. Session of the General Assembly of 1937.

In treated syphilis for example, it would be permissible to state that the ordinary case could be considered temporarily non-infectious within *five* days after beginning approved treatment, provided there were no open lesions, and the treatment is continued without interruption under the specified public health precautions until a state of permanent non-infectiousness is attained.

VI. Special Problems

"Close relationship usually exists between the incidence of syphilis and the character of the population. The incidence of this disease is particularly apt to be inflated if the population group is an urban one

or if the percentage of negroes in the population is higher than average. If success is to be attained in the control of syphilis special attention must be paid to the problem in urban areas and to the control of the disease among the negro population."

State and local health officers should see that the full benefit of modern syphilis control measures is extended to rural and urban residents alike. When municipal control programs are aided by State health departments infected individuals from surrounding rural areas who seek treatment in the municipality should be given the benefit of the services developed in the urban area.

VII. Need for Additional Financial Support

"The development of the campaign against syphilis is believed to be an equal responsibility of local, State and Federal Governments. All legislators responsible for the appropriation of public funds should be made fully acquainted with the huge extent of the syphilis problem and the possibilities for bringing the disease under control through the application of existing knowledge. It is the opinion of this Committee that the allotment of Federal funds will serve a most useful purpose by bringing forth new State and local appropriations if proper administrative policy is followed in making such allotments on a matching basis.

In a number of communities it has been clearly demonstrated that syphilis, like other communicable diseases, is distinctly and definitely preventable. In order to attain control it is necessary to improve Federal, State and local health administrative organizations to the end that prevention, early diagnosis and continuous treatment shall be available for every citizen requiring such service."

If we could only visualize, one by one, the blessing bestowed upon us through medical and surgical science and laboratory research, we, the people, would, with one accord call it blessed.

The length of the span of life from twenty years to sixty-two—the exchange of pain, sickness and sorrow that lead to poverty, crime and degradation—for health, happiness and prosperity has been achieved primarily through medical science, yet all are not availing themselves of those advantages.

The medical mind must devise the plan, and guide, direct, control, and promote its activities to best administer to the needs of the people.

In July, 1915, the writer read a paper before an audience of 350 mothers and potential mothers, the title of which was "Social Evil." It was said at that time that it was through false modesty and lack of knowledge that syphilis and gonorrhea are so extensive. Syphilis was called "syphilis" and gonorrhea called "gonorrhea."

Any offense to order, decency or health or injury to a third party, committed by prostitutes, constitutes a crime and is handled as such.

The diseased woman or man is treated, not as a criminal, but as one with a disease, and treatment is given and confidence gained and held until a crime is produced.

Recommendations

First—Abolition.

Second—Reporting of the social diseases by number.

Third—Reporting of the social diseases by name and address if the patient discontinues treatment before a cure is made.

Fourth—Establishment of a dispensary for the voluntary treatment of the male and female.

Fifth—Establishment of wards in hospitals for the treatment of the incapacitated.

Sixth—Establishment of proper places for the treatment of criminals.

Seventh—Laboratory diagnosis.

Eighth—Raising age of consent to 21.

Ninth—Education of the public and the children.

Tenth—Abolition of the public drinking cup, soap and roller towel.

In 1920, as President of the Medical Society of the State of North Carolina, under title "*Medical Legislation*" the writer made the following observations:

1. Yet, may I ask, have we not neglected our greatest asset to man in awaiting his call for aid and then attempting a cure, rather than anticipating his ills and preventing his calls. We advise how to get well where we should advise how to keep well.

2. Medicine, as an applied science, has through individuals, rather than a collective effort, made marvelous advances through her various avenues of research; this reward of merit through individual attainment should not be lost.

3. Then it behooves us for the sake of self preservation, if not for the higher motive, the preservation of humanity, to have a strong committee to watch, plan and outline, for those who are endeavoring to pass Medical Legislation, that we may guide their efforts in the proper way. Never before did we need, as we do now, intelligent leadership.

4. Experience has taught us something and we should awaken, ere it is too late, and realize that certain fundamental changes are to be made, and that this is necessary to society, before we are embarrassed by having our duties poorly done by incompetents.

5. Our already accumulated knowledge, if awakened and put into active service, can reduce sickness and accident one-half. The philanthropists, the politicians and the people at large have this interesting knowledge—made possible for them by us, and given to them by our press. Do you think for one moment that they are going to sit idly by and see this vast waste of human life?

6. Our individual problems may cause us to sit idly by, forgetful of, or, with indifference to, the greater problems of the community,

the State, or the United States health program and we will suffer the consequences of the inactive, thoughtless, indifferent citizen, and suffer in consequence of our inactiveness.

7. The physician is still an individual, and deals with his patient as an individual, failing to recognize that community interest must and should be conserved, even at a loss to the individual for the good of many.

In closing, may I be so presumptuous as to request the 100 per cent cooperation of the medical profession in combating, and in a united effort to exterminate one of our greatest evils, SYPHILIS.

DIVISION OF PREVENTIVE MEDICINE

The personnel for the period was composed of one medical director, one assistant medical director, one State supervisor for Crippled Children's department, one assistant in the department of health education, one State supervisor or consultant nurse, one nutritionist, one senior stenographer-clerk, three junior stenographer-clerks, two senior mailing clerks, and one junior mailing clerk to handle the mimeograph and multigraph machines, one maternal health league nurse, eight specially trained nurses who do field work in the department of school health supervision and the midwife control work, one junior accountant assigned to the budget department, and one clinical assistant assigned to the technicians at the Laboratory. In addition, the Division provided half the salary and expenses for a nurse in each of 25 counties and half the salary and expenses of two nurses in each of 14 counties. For the fiscal year ending June 30, 1937, special nurses were provided wholly from this department for each of sixteen counties. This plan was discontinued at the beginning of the last fiscal year of this period.

The work of this Division at the close of the biennium covered the following activities: A department of medical school inspection or school health supervision, health education, maternal and child health services, crippled children's service, and complete midwife control for unorganized counties. Another responsibility of this Division is the handling of medical correspondence, or the personal health service of the Board, issuing the monthly Health Bulletin, and, in addition, the Director is Assistant State Health Officer.

School Health Service

School health service was organized in 1918 by this Division and has functioned constantly ever since. During the two year period ending June 30, 1938, the nurses engaged in this work inspected the school children in 27 counties, comprising all the counties that do not now have whole time health departments. These counties are situated in practically every section of North Carolina. In this group of counties there are a few large and wealthy counties. Most of the counties are in the smaller population group. In such counties as they work, these nurses visit every school for both races and inspect the children and record their findings on suitable cards which are made permanent records in the offices of the county superintendents of schools in the various counties. They also lecture to the children grade by grade or in entire school groups. At the conclusion of the work, they present their findings to both the assembled teacher groups and to newspapers in the counties in which they work. They assist such organizations as the PTA, and the parents, and the medical and dental professions in every way possible to get follow-up done. They call definite attention to parents of the presence of apparent physical defects in their children. They instruct teachers and the parents and the children in

ordinary sanitary measures and impart information about the spread of communicable diseases.

During this two year period they have inspected a total of 784 schools and 87,255 children. A more detailed report follows:

No. children found defective	67,345
No. children having defects:	
Hearing	844
Vision	9,197
Teeth	36,139
Throat	36,856
Breathing	18,724
Posture	9,763
Orthopedic	504
Skin	2,870
Other	24,359
No. children found to be immunized:	
Diphtheria	22,736
Smallpox	23,991
Typhoid Fever	23,067
No. children with tonsils removed	7,306
No. children 10% or more under average weight	18,254
No. children 20% or more over average weight	1,701
No. schools with individual drinking cups or fountains of approved type	375
No. schools with oiled floors	590
No. schools with approved type of toilets for both sexes	454

Special School Health Service

During this biennium, an earlier activity of the department was revised and carried through on a much more elaborate scale than ever before. That was the inauguration of a series of Health Institutes during the last year of the biennium in cooperation with the public school teachers. With the aid of funds from the Children's Bureau, a hearing conservation program was carried out and also a nutritional program, during the last year of the biennium. A description of this work follows.

Health Institutes with Public School Teachers

Following the general plan of a program put on by the State Department of Public Instruction and the State Board of Health in 1917 in which 65 county teachers' institutes were visited and given a demonstration of the health inspection of school children, the State Board of Health, State Department of Public Instruction and the Extension Division of State College planned a series of 34 meetings with teachers, extending from March 10 through April 28, 1938. The individual programs lasted for three hours. The representative from the State Department of Public Instruction emphasized the importance of giving a proper allotment of time to health work. Attention was called to the available outlines and textbooks for regular health courses in the various grades.

The physician from the State Board of Health urged that teachers insist upon proper health facilities at the schools. Large charts were prepared and shown illustrating the leading causes of illness and the leading causes of death among school children in the primary, grammar and high school age groups. In order to cut down the lag between

the acquisition and the utilization of health information it was pointed out that the public school teachers can and should play an increasingly important role in health education.

The nurse from the State Board of Health then gave a demonstration of the regular health inspection that the teacher can make of her pupils. This demonstration was very effective and the teachers seemed anxious to better prepare themselves for this work. Attention was called to the fact that when the teacher is health minded and familiarizes herself with the handicaps that may be hindering the work of her pupils she will make use of her frequent contacts with parents and her monthly reports of scholastic work to call attention to these handicapping defects and thereby get them remedied more quickly than can be done in any other way.

The representative of the Home Demonstration Service of the Extension Division of State College stressed the importance of proper nutrition to good public school work. Charts, posters, leaflets, and pamphlets were made use of. The planning of home and school meals was discussed. The purposes of the various types of foods, the dangers of deficiencies of various types such as minerals and vitamins, and the vital importance of properly balanced and properly prepared meals were discussed.

Staffs of county, city and district health departments and local home demonstration agents were invited to attend these institutes and many of them were present. It is felt that at future similar institutes local boards of education, county commissioners and many of the parents should be present. Many improvements suggested will require additional appropriations or contributions and official bodies can be of great help. Unofficial groups such as parent-teacher associations, women's clubs, and men's clubs can also make helpful contributions.

At these 34 institutes the total attendance was about 7,880. The meetings should serve as a stimulus to a better correlated and more effective health program in the public schools.

A well-wrought permanent program of pupil and teacher health conservation can be very easily built upon the modest beginning made by this series of institutes.

Hearing Conservation Program

A new phase of school health work, that of hearing conservation, was undertaken by this Division in November, 1937. An audiometer of the 4A Type, with the proper equipment, was purchased and tests were begun in the public schools of Asheville and Buncombe County and later in Mecklenburg. Only children in grades three and above are tested, except where the teacher suspects difficulty in hearing among certain pupils in the first and second grades. Through the audiometer as many as forty pupils can be tested at a time.

The purpose of this undertaking is to find the hard-of-hearing children in the schools and to determine the amount of hearing loss each suffers. Wherever a loss of more than 10 per cent is found in a

child, his parents are informed and are advised that he be given a thorough examination by an ear, nose and throat specialist. His teachers are also advised that he be given special attention and aided in his work at school.

Out of 14,627 children tested in the public schools of Buncombe and Mecklenburg counties, 12,690 were found to have normal hearing, or with less than 10 per cent hearing loss, while 1,006 showed a loss of 10 to 30 per cent, and the others were reported doubtful or inconclusive. From these tests, data are being collected to determine the relation between a history of earache, running ears, head noises, tonsillectomy and adenoidectomy to loss-of-hearing in its various degrees.

Some of the results to be expected through such a program of finding the hard-of-hearing children in a school are:

1. That intelligent measures can be taken to improve the hearing status of some, stop progressive deterioration in others, and prevent hearing loss in a great many others.

2. That special care may be taken in teaching the individual hard-of-hearing child or children in school.

3. That lip-reading classes be formed where a sufficient number of children be found in a community.

4. That parents and teachers may come to know the importance of such preventive measures as avoiding colds, sore throats and ear infections, as well as the importance of prompt, remedial treatment of infected tonsils and adenoids.

5. That through prompt and proper treatment, the mental and emotional stability of hard-of-hearing persons may be protected.

Nutrition Program

A qualified nutritionist was employed in the fall of 1937. Until May, 1938, her services were used in the demonstration of audiometer testing of school children. She has attended several of the health department's maternity and infancy centers, serving as consultant nutritionist with the health officer, physicians conducting the centers, and the public health nurses. She has handled individual cases only insofar as this work could be used for demonstration teaching. There has been general approval of this program and requests for the services of this consultant nutritionist exceed the time available for one person to work.

Personal Health Service

An important service of this Division is that rendered through personal correspondence. Thousands of people, many of whom are distressed in mind or body, write to the State Board of Health for information, help or advice on almost every conceivable question relating to health in the field of medicine. Naturally, not all such questions can be answered, but even then no letter or communication is disregarded and every writer signing his name and giving correct

address gets a reply. The value of this friendly personal service to a large group of inquiring and anxious people is inestimable, and at the same time it is no little item in the regular day's work.

Health Education

Health Education as utilized by the State Board of Health comprises every available means of imparting information from one human to others. Naturally, the time-honored method is by the written and spoken word. In recent years the spoken word has been sent out far beyond any dreams of earlier workers. By the provision of the radio people now listen to the spoken voice who never had that opportunity before in listening to lectures and dialogues on the subject of keeping well. Therefore, our health education work embraces radio talks, regular and special publications, house to house contact in such things as nurse demonstrations, and the provision of moving picture service.

No phase of public health work is more important than health education. Only as the rank and file of people know and understand the principles and methods of disease prevention will there be any great progress of a permanent nature made in saving lives, cutting down sickness, and making life easier and happier for all the people. Reaching the people who need health instruction most is our greatest problem. Large numbers, especially of the colored race, do not read and write, neither do they have radios. Nevertheless, we keep the channels that are open to us, such as the press, radio, clinics, public health nurses, and the public schools, busy carrying the gospel of health to all people who will and can receive it. It has been said that if we could get to the people the knowledge which medical science has given us and get this knowledge converted into appropriate action, at least ten years would be added to the expectation of life of each newborn child.

The last two years have seen the educational health service of the Board increase in both volume and efficiency. The Health Bulletin, a monthly publication of sixteen pages, which is sent free on request to citizens of the State, continues to be the most important and effective means we have for reaching the people with health information. The publication is now in its 54th year. During the biennium the mailing list for this publication has increased from 37,000 to 46,000 copies. The editor, who is director of this division, endeavors to put into every issue some timely and understandable articles which may be of interest to every group of readers, lay and physician alike, and which over a period of twelve months, cover a great variety of health subjects. His editorials, "Notes and Comments," which are written out of many years' experience in public health work, are frequently copied by the press in and out of the State.

In addition to the 46,000 copies of the monthly Health Bulletin, this Division sent out during the last two years 2,990,040 copies of other free health literature. This consisted of forty or more different pamphlets and bulletins on such diseases as diphtheria, typhoid, hookworm, pellagra, cancer, and appendicitis. New books and pamphlets

of this nature are prepared and issued as new health knowledge increases and the needs demand. Much very valuable educational matter goes out regularly in mimeographed form, particularly reports, press articles and material of a temporary nature. This service has increased from several thousand sheets monthly to several million. During this biennium a grand total of 3,693,256 pieces of literature have been mailed out through this division.

Radio Service

Once a week, through the courtesy of WPTF, Raleigh, members of the staff of the State Board of Health go on the air with timely messages concerning the Board's public health services, methods of disease prevention, and ways of prolonging life. These weekly broadcasts that are prepared and presented by representatives of the nine divisions of work, feature usually the new and constructive ideas of their departments. To the thinking person they are informative, personally helpful and entertaining. That they are listened to and appreciated, we know from the number of letters and comments we receive concerning them. Copies of each article given over WPTF are sent to six other radio stations in the State or to the persons in charge of their health programs.

Maternal and Child Health Services

The work in this department during this biennium has been greatly enhanced through funds provided by the Children's Bureau under the Social Security law. From this source all of the nurses' service assigned to regular duties in counties as states elsewhere in this report, in addition to several employees in the Division office headquarters, has been made possible through Children's Bureau funds. The fundamental part of the service, however, has been maintained for about twenty years and is no different from what it has been during these years, with the exception that with Children's Bureau funds the service has been expanded and extended in every direction.

The practical plan of establishing Maternity and Infancy Centers with a responsible public health nurse in charge and with a practicing physician present to make the physical examinations of expectant mothers and of babies under one year of age has been thoroughly established during this biennium. This work is not new, having been done in some counties in the State for more than ten years. The group conferences years ago through which nurses assembled prenatal cases for instruction was well demonstrated but the provision of a practicing physician and, therefore, a thorough medical examination has been made possible through Children's Bureau funds. This service has been established in more than 40 counties on a more or less permanent basis.

During the biennium, 2,183 Centers were operated and 2,067 physicians were present for the period and made the examinations. In other words, there were 2,183 Center days with 2,067 physicians present two or more hours for the purpose of making physical examinations of expectant mothers or babies under one year of age brought

to these Centers. The Centers are open only to poor women who are dependent on midwife service for all their important medical needs incident to pregnancy and childbirth. They are open to the babies of the poor for advice from the nurses and physicians on infant feeding and the numerous things the mothers need to be advised on in the care of the baby.

In the two year period, there was a total of 2,148 new white women patients, 10,881 new colored women patients and 424 new Indian women patients, making a total of 13,453 women. Each one of these women supplied a specimen of blood which was sent to the State Laboratory of Hygiene for examination for the presence of syphilis. A total of little more than 12% of such examinations resulted in a report of the positive presence of syphilis in its active stages.

A large majority of the patients reporting the presence of toxemic conditions, of which there were more than 4,000 women, and of those suffering from syphilis were undergoing proper treatment before the termination of pregnancy.

In the Child Health Service division of the Centers, there was a total of 5,750 white babies brought to the Centers for the first time and a total of 16,044 negro babies, together with 96 Indian babies, making a total of 21,890 given medical examinations during the two year period. About 20% of the white babies were found to be suffering from malnutrition and about 30% of negro babies were suffering from food deficiencies.

The Division supplied free toxoid sufficient for the immunization of 50,000 babies during the two year period. This was supplied to health officers and the physicians throughout the State and was sufficient to immunize against diphtheria nearly a third of the babies born during the period. During the period, it was found necessary to send to hospitals for delivery nearly 800 of the women coming to the Centers for examination and advice.

For the first time in the history of the Board of Health, during this biennium an exhaustive effort was made in all of the counties not having a whole time health officer and in a majority of the counties with organized health departments to see and examine every midwife at work in the State. It is probable that about 75% of all the widwives at work were seen. A total of 255 midwife meetings were held, the attendance was anywhere from two to about forty, depending on the county and the area. In addition, nearly one thousand home visits were made to midwives who did not attend the meetings. As a result of this work in the last year of the biennium, 961 midwives were given permits to work by the nurses representing this Division. Added to this number about 1,200 were examined and permitted to work by health officers and nurses in county health departments. The best estimate at present would be that there are about 3,000 or fewer midwives at work in the State with about 2,200 of them properly granted permission to work upon meeting the minimum qualifications required by the State.

Reports from the whole State coming to this Division from whole time health officers being aided by funds coming through this Division and otherwise indicate that more than 25,000 women were examined in medical conferences for expectant mothers in the two year period. Nearly 18,000 visits were paid to such women after the birth of their babies and a total of nearly 40,000 nurse visits before and after the birth of the baby to women receiving this service.

Especial attention has been made toward stressing the importance of preschool examinations for children expected to enter school the following season. During this period nearly 23,000 children were given medical examinations and an additional 17,000 were examined by nurses. No estimate is here made of the many thousands of children receiving medical, surgical and dental treatment for the corrections of defects found in such examinations.

A complete system of mailing literature and supplies in the field of Maternal and Child Health has been organized and maintained by this Division. A sufficient number of clerical helpers devote their time to this work. During the biennium a total of 102,496 letters giving information to expectant mothers have been mailed out. These letters are sent directly to the mothers only at the request of the mother herself, the midwife or the physician, or some intimate friend. An excellent book known as Prenatal Care was sent to 32,222 expectant mothers. A total of nearly 300,000 pieces of special literature such as Daily Time Cards and Diet Lists giving instructions for feeding babies and information on special subjects such as infantile diarrhea, etc., were sent out. Another excellent book known as Infant Care was sent to 42,732 families having infants who requested this literature. In compliance with the State law requiring the Board of Health to supply silver nitrate prophylactic drops to physicians, hospitals, and midwives on request, a total of 22,756 packages were sent out. Each package had sufficient prophylactic drops for use in the eyes of six newborn babies. Thus a total of about 133,000 babies were supplied with these drops out of a total of little under 160,000 births for the period.

In addition to giving as close supervision as possible to the conduct of the Maternity and Infancy Centers established in more than 40 counties and to all the special activities in the Maternal and Child Health Service department, a special educational effort was made last spring to organize the observance of Child Health Day around the first of May on a special health education basis. In concluding this report we simply quote a paragraph prepared by Mrs. Highsmith, assistant in the department, who had charge of this work:

"At the request of the Children's Bureau, this Division has assumed the sponsorship of May Day—Child Health Day—observation in North Carolina for the past two years. Each year we have formed State-wide committees and issued programs and other educational material in the interest of speeding children on the road to health. Through the cooperation of the State Department of Public Instruction we reached

this year a large number of the 900,000 school children of the State with a Special May Day program, consisting of three health plays, songs, recitations, contests and pageants. Through numerous newspaper articles, public speeches and talks over the radio we endeavored to impress the public that the health and welfare of little children should be the first concern of any people. We cooperated with the Children's Bureau in distributing large quantities of May Day literature, in making reports and evaluating this annual observance in behalf of children's health."

DEPARTMENT FOR CRIPPLED CHILDREN

Historical Background

In undertaking a recapitulation of the activities and in setting forth the attainments of the Crippled Children's Services of the State Board of Health, it seems pertinent to briefly review the history of the crippled child movement in the State. It was as late as the decade nineteen ten to nineteen twenty that the people of the State became conscious of the extent of need among children of the lower social and economic levels—crippled children being no exception. During that period there appears to have been an awakening to some of these needs and particularly in respect to the crippled child; so that we find divers citizen-groups and individuals who became interested and gave of their time, means, effort and thought toward doing things for a small number of such sufferers.

Notable in many communities of the State were the activities of civic clubs for their sponsorship of individual children requiring orthopedic care. Such care was usually arranged by committees of these clubs and by certain individuals who found the time to visit medical centers without the state where specialized services of this nature were available. These sponsors contributed personal service in the transportation of the child and finances to meet certain costs that were necessary. Numbers of children affected by mild degrees of deformity were cared for through the general medical care afforded in some of the communities.

Even more notable was the movement at Gastonia which resulted in legislation authorizing the establishment of a Crippled Children's Hospital, enacted by the Legislature of 1917. This enactment, creating a Board of Trustees for such an institution and making a small appropriation therefor, was the first recognition and establishment of policy in respect to the problem of the crippled child in the State, and it has been under this guidance that further services and policy have evolved.

The North Carolina Orthopedic Hospital acquired various resources and with further grants from the Legislature was built and opened in 1921 with a capacity of approximately 50 children limited to the white race of age levels of sixteen years and under. Soon after its establishment an extension service in the form of occasional diagnostic clinics was organized and for some time this constituted the

primary method of locating children in the State who were in need of this type of service.

In 1925 the State Board of Health, in conjunction with the vocational services of the State Department of Education, worked out several clinics for cripples which were to serve to locate cripples more readily, provide diagnosis, and in limited cases provide minor treatments. The main objective of these clinics was to extend such services to age levels above sixteen and with a small appropriation from the Legislature and greater amounts of local private philanthropy these clinics provided for a much larger number of individuals of all age levels than had been possible theretofore. Whereas this expansion of crippled children's work was a marked advance, the most valuable effect was that it brought to light the broad aspects of the problems of the cripple, and the indication for increasing the scope of the State's services to this group.

With the passage of the Social Security Act and its provision for crippled children, the State Board of Health was designated to coordinate the State services for crippled children, which led to the establishment of this Division of that Agency. The biennial period covered by this report approximates the period in which the Division for Crippled Children has existed, for, though it was organized three months before the close of the previous biennium, little more than organizational work had been achieved. However, reference is made to the last biennial report wherein the following "objectives" were set forth:

"(1) to locate and register all crippled children in the State; (2) to effect and facilitate treatment of these children; and (3) to follow up these children until the age of twenty-one years."

Therefore, we submit the following report of progress toward the attainment of these "objectives":

I. Registration: (Children are located and referred to clinic centers for classification and are admitted to register only after diagnosis by a recognized orthopedic surgeon.)

Crippled children on State register July 1, 1936.....	8,189
Crippled children on State register June 30, 1938.....	13,510

Crippled children placed on register 2-year period.....	5,321
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II. Treatment:

There are two interrelated methods by which treatment is provided: (1) through well organized and regular clinics conducted by recognized specialists in the field, located at strategic centers throughout the State and accessible to all citizens; (2) 18 selected general hospitals; and, (3) the North Carolina Orthopedic Hospital (report of the latter is excluded from the statistics considered in this report). The attached map indicates the location and distribution of the clinics. Also, attached is a schedule of the clinics. It should be pointed out that, while these clinics are primarily for children under 21 years of age, persons with crippling defects more than 21 years of age are

admitted for diagnostic services and, therefore, will be reported with the distinction "adults."

A. Clinics (July 1, 1936, to June 30, 1938)

1. Number of clinic sessions conducted.....	377
2. Number new cases children admitted and examined....	4,545
3. Number old cases children admitted and examined....	5,423
4. Number examinations of children (2 plus 3).....	9,968
5. Number casts (applied or adjusted).....	1,017
6. Number braces (advised, measured, fitted, or ad- justed)	350
7. Number dressings (applied or removed).....	1,519
8. Number bandage (proprietary) or strapping (adv. or app.)	279
9. Number corrective shoes (advised, applied, or ad- justed)	627
10. Number corrective exercises or massages (adv. or directed)	706
11. Number dietetic treatment (advised or directed)*....	326
12. Number new cases adults admitted and examined.....	1,422
13. Number old cases adults admitted and re-examined....	1,105
14. Number examinations adults (12 plus 13)**.....	2,527

Grand Total examinations (4 plus 14).....12,495

The technical services of the clinic are performed by or are under the direction of a qualified orthopedic surgeon of whom there are eleven resident of North Carolina.

B. Hospitalization (July 1, 1936, to June 30, 1938).

1. Number children authorized for admission to general hospitals	1,591
2. Number children admitted to general hospitals.....	1,502
3. Number children extension authorizations (involves 368 readmissions)	641
4. Number children discharged general hospitals.....	1,622
5. Number days' care rendered.....	39,188
6. Number average days' care per discharge.....	24.2
7. Number average cost care and treatment.....	\$97.50

C. Special Boarding Home Care.

1. Number children admitted to boarding homes***.....	3
2. Number children discharged from boarding homes....	1

D. Appliances.

1. Number of appliances purchased	197
2. Average cost of appliances.....	\$27.00

III. Follow Up:

As proposed in our "objectives" at the outset of the organization, the State Agency has functioned in a vital way to the needs of chil-

*Statistics not available prior to February, 1937.

**Clinic services to adults are principally diagnostic.

***This feature of care was begun in September, 1937.

dren through the follow up services. We undertake to set forth evidence of the effectiveness of this feature of our plan. We have cause to take pride in these achievements. While the tangible results may not be apparent to one considering this report, we have unmistakable evidence that the follow-up service is vital to the promotion of all features of the service, and, indeed, serves as the greatest conserving element of the other services. We need to expand in personnel in respect to the follow-up which would effect a better coordination of local personnel in this important feature of crippled children's work.

A. Field Service

1. Office

a. Number state staff conferences.....	53
b. Number conferences with surgeons.....	577
c. Number conferences with health officials.....	895
d. Number conferences with welfare officials.....	954
e. Number conferences with official bodies.....	10
f. Number conferences with non-official bodies.....	13
g. Number other conferences.....	1,716
h. Number talks	32
i. Number in attendance.....	1,471

2. Clinic

a. Number clinic attendants by state staff.....	494
b. Number patients contacted (present at examination)	14,074
c. Number instructions to patients.....	3,673

3. Field

a. Number investigating visits.....	1,066
b. Number new cases located.....	445
c. Number home visits to new cases.....	680
d. Number home visits to old cases.....	2,191
e. Number new cases referred to clinic or surgeon.....	617
f. Number old cases referred to clinic or surgeon.....	1,558
g. Number not home visits.....	372
h. Number appliances adjusted.....	89
i. Number exercises (given or instructed).....	429
j. Number therapies (given or instructed).....	193
k. Number cases referred to Vocational Rehabilitation	495

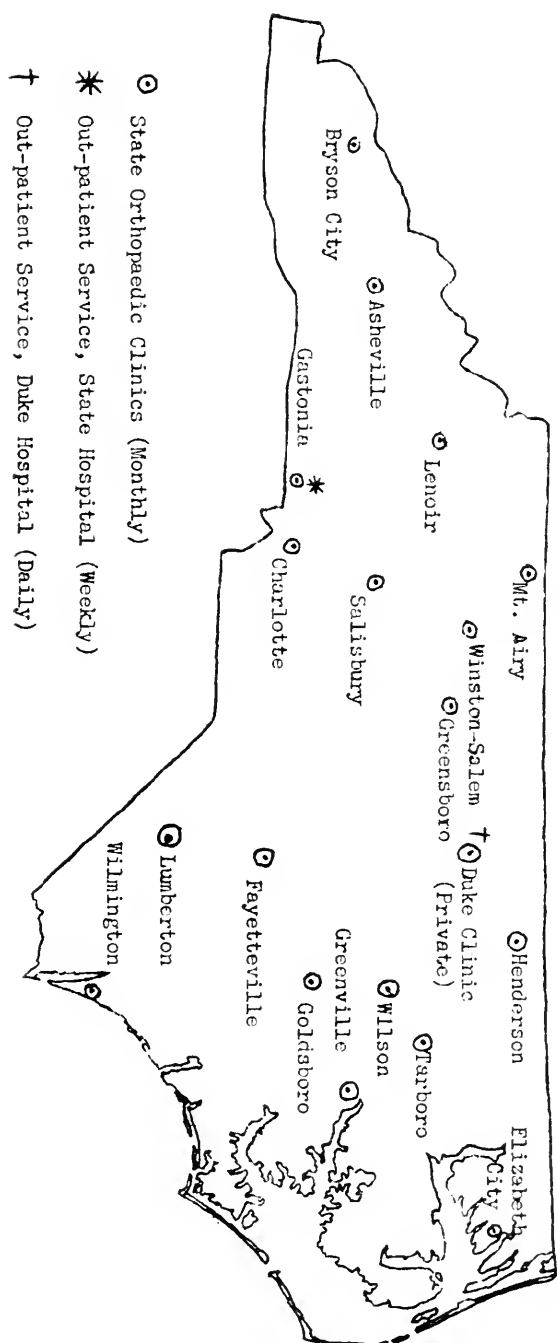
In conclusion recognition should be given to many civic clubs and other community organizations which have contributed to the support of crippled children's work. It is estimated that civic clubs contribute \$8,000 annually to certain essential expenses connected with the clinic work alone. These funds, of course, are not reckoned through any of the public treasuries dispensing crippled children's funds. However, these expenditures are and will continue to be vital to the tangible results of the State program. Recognition should also be made of the personal assistance rendered to the organization and to children through local volunteer committees engaged in the work of the clinics as well as other phases of the program; to the local health

organizations for technical advice and supervision of patients both in the homes and the clinics, and to the welfare agencies in respect to the problems of transportation and subsistence needs of children with whom we are concerned in our program.

The State Agency continues its interest in the ultimate goal for the cripples to attain education, training and employment placement. For this reason we have cooperated with all educational facilities and especially with the Department of Vocational Rehabilitation, which is concerned with the educational and vocational rehabilitation of the group above the sixteen year level. We shall continue in this capacity of meeting the medical aspects of cripples' needs and of referring those physically restored to the agencies concerned with the educational achievements of the individual crippled child.

Worthy of mention is the development of a training center for children affected by spastic paralysis supported by a private philanthropist. This is important inasmuch as it is estimated that the spastic cripple represents approximately 8 to 10 per cent of the registration of cripples in the state. This project has been worked out in Durham and is receiving direction from one of the best authorities on spastic conditions the country affords. We are glad that marked progress has been noted in several children admitted to these services and the State Agency will continue to support these efforts through its organization, though not actually participating in the costs thereof.

CLINIC SERVICES FOR CRIPPLED CHILDREN
NORTH CAROLINA STATE BOARD OF HEALTH



DIVISION OF SANITARY ENGINEERING

Undoubtedly, the most outstanding work of the Division of Sanitary Engineering during the biennium just past has been in cooperation with the various agencies of the Federal Government by way of promoting and encouraging community sanitation and malaria control drainage work, and the construction of more, better, and larger water works, sewer systems, water purification plants, and sewage treatment plants. Literally millions of dollars of public funds have been invested in these public improvements which under careful supervision do so much to modernize, to improve the public health, and to raise the standard of living in every section of the state.

Largely through the promotional efforts of this division, and through aid from Federal grants and financing by the PWA and WPA, public works improvements of great public health value have been brought under construction between July 1, 1936 and June 30, 1938, as follows:

Eight New Water Purification Plants

Charlotte	Mount Gilead	Valdese
Hemp	Proximity	Mayodan
Hiwassee	Spray	supplying Madison also

Nineteen New Water Systems

Angier	Hemp	Longview	Richlands
Burgaw	Hiwassee	Lucama	Stoneville
Candor	Jackson	Mt. Pleasant	Whitakers
Cornelius	Kieckhefer Mill	Newland	Winton
Fuquay Springs	Village	Pilot Mountain	Yanceyville

Twenty-one New Sewerage Systems

Angier	Jonesboro	Newland	West Jefferson
Burgaw	Kieckhefer Mill	Pilot Mountain	Whitakers
Candor	Village	Richlands	Winton
Fuquay Springs	Lucama	Stantonsburg	Yanceyville
Hemp	Morven	Stoneville	
Jackson	Mt. Pleasant	Tabor City	

And the Following Twenty-one New Sewage Treatment Plants:

Albemarle	Jonesboro	Mt. Pleasant	West Jefferson
Angier	Kieckhefer Mill	Newland	Whitakers
Candor	Village	Greensboro	Burgaw
Fuquay Springs	Liberty	Pilot Mountain	Hemp
Farmville	Lucama	Stantonsburg	Yanceyville
Jackson	Morven	Tabor City	

In addition to the building of these entirely new plants, the value and benefits of approximately two hundred and fifty existing water works systems and sewer systems in the state have been greatly increased through the extension of a great many water and sewer

mains, making thousands of homes in cities and towns accessible to water and sewer lines that were not previously accessible. In this way many thousands of old privies and private wells have been eliminated from built-up areas in and adjacent to municipalities where the danger from insanitary methods of excreta disposal and dangerous private water supplies is one of the greatest hazards to the public health. Water and sewer extensions and connections have been encouraged to such an extent that for the first time our records show that in at least six cities and towns in the state, 100% of the homes are connected to sewers and have no privies. Several other towns maintain that 98% to 99% of the homes are connected to sewers.

The extent of this promotional work can best be appreciated when it is noted that whereas from 15 to 20 years ago a great many incorporated cities and towns of from 2,000 to 3,000 population were without the benefits of public water supplies and sewerage, now there are no incorporated towns of 2,000 population or more in the state that do not have water works and sewerage. In fact, there are only seven North Carolina cities and towns of over 1,000 population without water works and sewerage, and five of these seven have been encouraged to make plans for and file applications with the PWA for loans and grants with which to construct public water supplies and sewers.

While practically all of our larger cities and towns now have water works and sewers, it is gratifying to note that 27 towns from 800 to 1,000 population now have water works, 29 towns from 500 to 800 population also have such modern facilities, and, finally there are 33 communities ranging from 100 to 500 population with public water supplies.

While all this improvement is very gratifying, at the same time it will be readily appreciated that every new water plant and every new sewage treatment plant means careful review of all design data and plans, often with alterations in the original plans. Then after installation, there are additional calls for service, additional inspections, reports, and checks on the maintenance and operation to insure that these water and sewer improvements may be properly and intelligently operated, and may not be the cause of a public or widespread epidemic of some water-borne disease. Fortunately, no such epidemic or outbreak has appeared in North Carolina during the biennium.

One of the best ways to insure the safety of public water supplies, and the satisfactory operation of water and sewage works, is to have trained local operators in charge of these plants. Unfortunately, this is not always possible. Furthermore, it is important that experienced operators review their chemistry and bacteriology, and keep well abreast with the rapidly changing art of water purification and sewage treatment. To this end, an annual water works short course has been held at State College in cooperation with the college faculty. At the Public Health School at Chapel Hill, a highly successful two weeks sewage works short course for sewage works men in the southeastern states was given under the direction of Dr. H. G. Baity during the past year. It is felt that only through the invaluable assist-

ance of such short courses is the State Board of Health able to cope with the tremendous responsibility of maintaining a passing semblance of safe operation of public water supplies, and reasonably efficient sewage treatment.

North Carolina now has 101 water purification plants of which only 35 are under the control of what may be classed as technically trained operators. All too frequently in the past municipal authorities are found to be perfectly willing to intrust the operation of a \$100,000 to a \$1,000,000 water purification plant, as well as the lives and health of thousands of people to some person untrained in chemistry, bacteriology, or the operation of water or sewage works. Undoubtedly, the men who operate our water and sewage works plants should be properly trained and licensed men. The public is entitled to intelligent protection of the water it drinks and not exposed to political whims, or possible pollution of a water supply with frequent changes of municipal administration.

Malaria Control

During the past two years the Malaria Control Drainage Program has been carried on with Federal funds provided by the Works Progress Administration. This program is planned, supervised, and directed by the State Board of Health and the U. S. Public Health Service and is an integral part of a long time program for the eventual eradication of malaria in Southeastern United States. Under their direction and supervision, projects were operated in 56 malarious counties in the State. For the two year period, a total of 704 miles of ditches and canals have been constructed, and 391 miles of existing ditches cleaned. This work drained 13,800 acres of mosquito-breeding ponds and swamps. Sixty acres of ponds were eliminated by filling. To accomplish this, an average of 1,690 workers and 7 dredges were used each month. Over one-half million individuals have been directly affected by the malaria control program. For the past two years approximately 22% of the total cost of the work has been borne by the people directly benefited. The benefits derived from these major projects are enormous.

Of the total amount of new ditches constructed, 131 miles consisted of major canals dug with heavy dredging machinery which provided drainage outlets for large swamps that could not be drained by hand labor. The cost of such operations was far too expensive for the landowners to undertake without aid.

Right-of-way easements and maintenance contracts are required from the landowners where projects are to be worked. The work is laid out and supervised by engineers who have been trained for this particular type of work. Plans for future projects are being made to concentrate control work in areas which have been found, from blood slide surveys, to be endemic malaria foci.

From the Malaria Control Program in North Carolina there are economic as well as health benefits. It has been demonstrated that residents of a malarious territory have an earning power of only two-thirds that of people living in a similar territory free from malaria.

The expense of technical supervision on all projects has been less than 2% of their cost. The supervisory personnel for 1936-1937 consisted of one assistant State director and five district supervisors. For 1937-1938 this number was reduced by one district supervisor. Salaries and traveling expenses for these men were paid by the U. S. Public Health Service. For the year 1938-1939 the supervisory staff has been further reduced to one assistant State director and three district supervisors. This expense will be borne partly by the U. S. Public Health Service and partly by the State Board of Health. It is anticipated that in the future all of the supervisory cost will be met by the State Board of Health. The reduction in supervisory personnel has already meant curtailing malaria control activities in the State.

Community Sanitation

In cooperation with the Works Progress Administration and the U. S. Public Health Service, which has provided the funds for technical supervision, there has been built in North Carolina during the past biennium 63,434 pit privies. During the previous biennium there were constructed a total of 37,625 privies. While the work has been carried on under the State privy law, through the cooperation of the WPA, the householder is required to furnish only the material while the WPA provides the labor for construction.

A constant effort is being made to improve the quality and durability of these structures. In this connection, it is interesting to note that whereas in the past, privies "loomed through the mist of years" as "weather beaten objects," now 75.1% of all privies built in N. C. are painted. At the beginning of the biennium only 41.2% of the privies built were of the concrete slab and riser type, but at the end of the biennium the percentage of concrete slab privies had risen to 87.2%.

The total labor cost for these 63,434 privies was \$810,180.66 or \$12.77 per unit. The total material cost was \$938,253.16 or \$14.79 per unit. The total cost of labor and materials for this work during the biennium was \$1,748,433.82 or \$27.58 per privy. The construction work involved 2,469,541 man hours or 38.9 man hours per unit. An average of approximately 800 WPA workmen on these projects were under the general supervision of this Board.

While it is recognized that privies do not compare with water carried sewage in point of sanitation, at the same time these privies represent a great advance over surface privies with the fecal matter exposed to flies, chickens, and domestic animals, or no means of excreta disposal at all. At least 300,000 families in North Carolina are still without running water and water carried sewage. For these families such work is an important sanitary advance.

School Sanitation

During the biennium it was possible, with Social Security funds, to make a school sanitation survey of 4,194 public schools in the State. This represented over 99% of our schools. Of the 4,194 public schools surveyed, the following condensed tables show the essential features found:

SCHOOL WATER SUPPLIES			EXCRETA DISPOSAL				
Fair to Good	Bad	None	Water Carried	Sewerage*	Privies*		
Fair to Good	Bad	None	Fair to Good	Bad	Fair to Good	Bad	None
1653	1427	1114	1151	129	1454	1384	120

From this, it will be seen that 1,653 schools have what may be considered reasonably safe water supplies, while 2,541 have either no water supply whatsoever, or what may be termed a questionable to bad water supply.

Similarly, while 1,151 schools have what may be considered to be reasonably clean, safe water carried sewerage, and 1,454 more schools have what may be considered to be reasonably satisfactory pit privies, a total of 2,605 out of 4,194, or 62%, at the same time 129 schools have bad sewerage, 1,384 have insanitary privies, and 120 have no means of excreta disposal whatsoever.

This survey indicated that school sanitation in North Carolina is still at a low ebb. It is felt that this is due largely to the divided responsibility, and to inadequate and obsolete laws on this subject.

While much could be done to improve the sanitary conditions in our schools by working with the janitors, teachers, principals, county superintendents, school committeemen, county boards of education, and county boards of commissioners, at the same time such work to be very effective requires such an enormous amount of funds and personnel that for the present at least, such work among 4,000 schools must of necessity be limited. It is firmly believed that school sanitation cannot advance as rapidly as it should until our laws are clarified and some one agency made responsible for our physical school plants, and for school sanitation.

Recreational Sanitation

Through the biennium the division has continued to assist and encourage better sanitation in swimming pool construction and operation. Practically all of the pools constructed within the biennium were built according to plans and specifications approved by this Board. There is, however, no State law on swimming pool sanitation.

With ever increasing thousands of tourists thronging our highways, mountains, and seashores, it is felt that as an advertising measure to tourist trade, as a good will gesture, and certainly as a public health measure for the protection of everyone, our recreational and roadside sanitation should be markedly improved. This problem of recreational and roadside sanitation must be faced, if the residents of this State and visitors from other States and nations are to be given adequate health protection. It is felt that this is the time to provide such public health engineering service in the Division of Sanitary Engineering to the end that recreational facilities will be properly constructed, maintained, and operated.

Milk Sanitation

A State milk sanitation program may be divided into three phases; first, the promotion of the use of more milk in the interest of better

*44 schools have both privies and water carried sewerage.

general nutrition; second, the improvement of the sanitary conditions of milk production and handling so that the milk supplies will be cleaner and safer; and third, the promotion of the increased use of properly pasteurized milk so that more people will receive the benefits of this important final health safeguard. Progress in all three of these phases during the biennium has been gratifying.

The following table illustrates recent progress in two of the phases of the work:

Date	No. of towns with USPHS Milk Ordinance	No. of towns with milk ratings of 90% or more	No. of towns surveyed	Daily Milk consumption in pints per capita
1928	....	....	39	0.415
1929	....	....	45	0.405
1930	....	....	45	0.420
Dec. 31, 1931	74	0	31	0.382
Dec. 31, 1932	86	6	58	0.394
Dec. 31, 1933	97	24	45	0.396
Dec. 31, 1934	104	29	60	0.394
Dec. 31, 1935	105	33	22	0.356
June 30, 1936	108	36	....	.....
Dec. 31, 1936	....	28	64	0.384
Dec. 31, 1937	140	59	37	0.425
June 30, 1938	156	58	18	0.479

The milk consumption in the North Carolina towns surveyed in 1937 was, according to these figures, 19% greater than the 1935 figure, which was the lowest of recent years. Preliminary data for 1938 indicate a further substantial increase in milk consumption. It will be noted, however, that we must increase our milk consumption much more before we reach our goal of at least one pint daily for adults and one quart daily for children under 16.

The sanitary conditions of milk production and handling are indicated in part by the rating achieved by milk supplies. These ratings are computed by the U. S. Public Health Service on the basis of official surveys made by their employees or by the personnel of this division, using a uniform survey procedure designed by the U. S. Public Health Service. Comparison between milk supplies in different parts of the United States is made possible by this uniform survey procedure. At the end of the present biennium North Carolina had 58 cities and towns with milk ratings of 90% or more, as compared with 36 such towns in 1936; such ratings indicate reasonably good compliance with the milk sanitation requirements. Texas, with 18 towns having milk ratings above 90%, is the State nearest North Carolina in this respect.

North Carolina now has 156 towns operating under the U. S. Public Health Service Milk Ordinance, as compared with 109 in 1936. Our goal is to have all these towns achieve a milk rating of practically 100%.

The consumption of pasteurized milk in 1937 was about 22% greater than in 1936, and preliminary figures for 1938 indicate that this increase is continuing. It is interesting to notice that the consumption of pasteurized milk in 1937 was 120% greater than the consump-

tion in 1929. During the biennium pasteurization was started for the first time in 24 plants, 12 of which were entirely new buildings; 8 plants were remodeled; and at present 9 more are under construction, four of these being new buildings. This rapid increase in pasteurization is gratifying, but much remains to be done in this field, since it is estimated that in towns of 5,000 population or more, slightly less than one-half of the milk supply is pasteurized.

Because it is essential that pasteurization be done properly, and because the pasteurization plant building design in many cases is directly related to the effectiveness of pasteurization, this department has continued its policy, begun in 1934, of recommending that plans for all new or remodeled pasteurization plants be submitted for criticism and approval before construction is begun. In the case of many small plants where the employment of an engineer or architect was not possible, this department has found it necessary to prepare rough plans in order to obtain satisfactory buildings.

A bulletin on milk sanitation is being prepared. Its purpose will be to assist milk sanitarians and dairymen to obtain economical, durable, and sanitary structures and to maintain sanitary conditions of milk production and handling.

Plumbing

The 1937 Legislature passed the State Building Code. The State Plumbing Code, a part of this Building Code, was written in accordance with the advice of the Division of Sanitary Engineering, which as the logical agency, has for years published and distributed a plumbing code. Although there is no enforcement of the State Plumbing Code, there will certainly come a time when there should be enforcement. The framers of the Code, as well as the members of the State Building Code Council, consider that, as in other States, the Division of Sanitary Engineering should be the enforcing agency; however, this should not be attempted unless adequate funds are available.

Shellfish Sanitation

Much progress has been made in the sanitation of the shellfish industry during the past two years. A system of scoring and grading shellfish shucking establishments has been adopted and put into practice. By this system, the shucking plants are now being rated and awarded grades as Grade A, Grade B, or Grade C, according to the type of construction and the method and cleanliness of operation. This is the first time such a system of rating and grading oyster shucking plants has been used in the United States. Regular monthly inspections of the shucking and packing plants have been made and their grades published in the various newspapers throughout the State. This system has created much friendly rivalry in the matter of shellfish sanitation, and many improvements have been made since its introduction.

Twelve shucking plants have been refused permits to operate while fourteen new shucking plants have been erected. The remaining plants have been reconstructed or repaired to meet the requirements

of the U. S. Public Health Service for interstate shipments. An average of 38 shucking houses and 50 shellstock oyster and clam packing plants have operated during this biennium. A total of 700 inspections have been made of these plants.

Sanitary and bacteriological surveys have been conducted around Wrightsville Beach in an effort to clean up the polluted condition of the restricted waters in the Wrightsville Sound area. With the construction of the new highway and the cooperation of the town officials, it has been possible to remove all sewer lines that have previously emptied sewage into the sound waters. With the sewage now being disposed of by means of residential disposal plants, it is hoped that the restriction of this body of water may be lifted within the near future. Constant supervision has been given over the patrolling of other restricted territories and several persons have been prosecuted in court for taking shellfish from these polluted areas.

In addition to the clam and oyster work, this office has given close supervision over the crab meat packing industry. In cooperation with the U. S. Food and Drug Administration, regular inspection and laboratory control have been maintained over the fourteen crab meat packing plants that operated along the North Carolina coast during the biennium.

In addition to the shellfish activities, this office has made surveys of all herring roe canneries operating in the State for the purpose of determining the sanitary conditions under which herring roe is being packed and for the further purpose of studying the needs of the industry from the standpoint of sanitary supervision. If this industry is to continue to improve and offer a safe and wholesome food product to the public, it is very necessary that the State provide reasonable regulations governing the sanitation of this great food industry.

Stream Pollution

Stream pollution in North Carolina is recognized as one of our greatest problems by the engineers and experts of the National Resources Committee. With the increase in population of cities and towns, a still greater increase in the use of water carried sewerage and a much greater increase in industrial wastes, the problem of stream pollution is becoming more and more pressing. It is recognized by all who have given thought to the problem that the first use of our streams should be for public water supplies. This is the basis of the laws which have given the State Board of Health general supervision over streams. In the exercise of this supervision, it is essential that there be long range planning, and that in cooperation with industry, policies and programs be set up which will be beneficial to the State as a whole, anticipating future needs for water.

The coming of pulp and paper mills to North Carolina has created new problems in the Roanoke and Chowan Rivers affecting our shellfish industry and damaging, or destroying, a valuable fishing industry at Plymouth. Interstate problems are involved, as illustrated by the establishment recently of a large pulp mill on the Chowan River watershed at Franklin, Virginia. Wastes from pulp mills in the

western part of the State drain into the Tennessee Valley. Pulp and paper mill wastes not only throw heavy pollution loads on our streams, but the problems of treating these wastes are very difficult to solve from both the chemical and economic viewpoints. Some initial studies have been made by the Tennessee Valley Authority with the cooperation of our engineers on the character of this type of pollution. At the present time a large cigarette paper manufacturing plant is being constructed near Brevard.

Another serious problem of stream pollution originates from textile mill wastes. The Textile Foundation, under the direction of Dr. H. G. Baity, has been studying this problem for a number of years. The sewage treatment plant at Greensboro represents the most advanced practice in the State on the treatment of a combination of domestic sewage with large volumes of textile mill wastes.

Municipal sewage treatment plant construction has advanced much more rapidly than the construction of new municipal sewerage systems. In 1928 there were 92 municipalities that had sewage treatment plants. In 1938 there were 129 municipalities that had such plants, or an increase in ten years of 40%. In 1928 there were 124 municipal sewage treatment plants, while ten years later there were 176 municipal sewage treatment plants, or an increase of 42%. This has been largely due to the increased consciousness on the part of citizens of the State that sewage treatment is necessary, especially when such construction was possible with Federal aid.

The question often arises as to the type and degree of treatment which should be provided by an industry, or more frequently by a municipality. Decisions of this kind, which always involve thousands of dollars, and in some instances hundreds of thousands of dollars, should be based on adequate technical and engineering data. At the present time this division has neither the funds nor personnel with which to make such studies. Instead of the present almost catch-as-catch-can method of attempting to get sewage treatment plants built wherever possible, it would certainly be great economy and efficiency to establish for each watershed and stream a pollution abatement policy for long range planning based on actual stream studies. This would save some of the incongruities found at present. Only with planning for the future, will it be possible for the State to preserve its valuable water resources for their highest use, that is for public water supplies.

It would seem that the State of North Carolina would very advisedly plan ahead to the time when more serious work on stream pollution abatement will actually be done. To effectively solve these problems of stream pollution and industrial waste treatment, additional sanitary engineers and laboratory facilities are necessary.

Hotel and Cafe Work

Marked improvement has been made in the cleanliness and general sanitation of the hotels and cafes of the State. The sanitary improvement during the past two years has been such as to frequently attract favorable comment from casual observers. Of the thousands of hotel

and cafe, and other inspections made, it should be noted that in practically every case an inspection results in one or more personal conferences, reports, follow-ups, or follow-up letters. A mere inspection without an explanation of the sanitary defects found, how to remedy them, and where possible the securing of a promise to improve the condition, is of little value. The aim of all inspection work is to secure close compliance with good sanitary practice.

The following statistics indicate numerically some of the inspectional activities of the Division of Sanitary Engineering during the biennium which can be readily enumerated:

<i>Type of Inspections</i>	<i>Number of Inspections</i>
PRIVY (Exclusive of Community Sanitation)	
Number of inspections.....	4,037
DAIRY SANITATION	
Number of dairy inspections.....	4,886
Number of pasteurizing plant inspections.....	540
MUNICIPAL WATER	
Number of municipal water system and plant inspections	1,115
MUNICIPAL SEWERAGE	
Number of municipal sewerage system and plant inspections	624
PRIVATE SEWAGE DISPOSAL	
Number of private disposal system inspections.....	1,752
PRIVATE WATER SUPPLIES	
Number of private water supply inspections.....	3,057
FEDERAL HOUSING ADMINISTRATION	
Number of FHA inspections.....	232
SHELLFISH SANITATION	
Number of shellfish inspections.....	937
HOTEL AND CAFE	
Number of hotel inspections.....	1,456
Number of cafe inspections.....	8,616
SCHOOL SANITATION	
Number of school inspections.....	306
SWIMMING POOLS	
Number of swimming pool inspections.....	28
BEDDING	
Number of inspections of retail bedding places.....	4,045
Number of inspections of manufacturing plants.....	5,698
Number of pieces of bedding condemned.....	12,050
Number of waste dealer inspections.....	136
COUNTY PRISON CAMPS	
Number of county prison camp inspections.....	36
JAILS	
Number of jail inspections.....	15
SUMMER CAMPS	
Number of summer camp inspections.....	12
INTERSTATE CARRIER WATER SUPPLIES	
Number of interstate carrier water supply inspections..	85
MEAT MARKET AND ABATTOIR	
Number of meat market inspections.....	153
Number of abattoir inspections.....	30

General

There are many minor activities of this division which, while they do not loom large in themselves, at the same time they require a lot of time and effort, in order to render the sanitary service demanded by the general public. An annual correspondence totaling between 20,000 and 25,000 individual letters a year requires a lot of work in securing the data and furnishing the information requested. This is in addition to mimeographed letters and printed matter sent out.

Assistance is rendered engineers and architects in properly designing approximately 50 small sewage treatment plants a year for use at schools and institutions throughout the State.

Inasmuch as no practicing architect or engineer in the State, except the State Highway Commission, is known to have facilities for testing sewage filter sand, this office runs from one to two sand analyses a week to assist small communities in getting satisfactory filter sand for their sewage treatment plants.

Through the cooperation of the Federal Housing Administration, the State Board of Health approves the sanitation of all private water supplies and residential sewage disposal plants before the Administration will grant loans. This has resulted in practically eliminating the bad practice of installing 200 to 300 gallon septic tanks that prove so inadequate within a few years, and which has to a large extent brought residential sewage disposal plants into disrepute where such inadequate tanks were installed in the past.

Through the cooperation of the U. S. Public Health Service, it has been possible to provide valuable public health engineering training for nine engineers and sanitarians of this division. It is hoped that this means of developing and training personnel for better work will be continued.

The annual Sanitarians' School-Conference conducted at North Carolina State College has been a valuable means of instruction and training for local and district sanitarians throughout the State.

Through the enforcement of the Bedding Law, much old, unsterilized, second-hand mattress material has been prevented from being foisted off onto the public under the guise of new material.

With the passage of a meat market and abattoir law, tentative rules and regulations have been drafted, tried out, and redrafted several times, and are now in successful operation. The enforcement of this act will go a long way toward cleaning up our meat markets, and to some extent our grocery stores. Furthermore, it is believed that by cleaning up our local abattoirs and slaughter houses, a quality of local meat will soon be produced in North Carolina which will bring "native meats" into a class with "western meats" to the great advantage of our local butchers and cattle raisers.

A small amount of work is done for summer camps, but inasmuch as there is no statutory provision for camp sanitation, this work is largely on a voluntary basis. While some camps clean up willingly, others will not and a feeling of unfairness results.

Many other activities range from supervising and giving instruction in sanitary work to local dairy sanitarians, city and county sanitarians, and food officials to checking the laboratory methods and operation of chemical feed devices at water and sewage works; and from ferreting out cross connections and having them broken to encouraging the use of modern water works and sewer equipment where old equipment becomes worn out.

Conclusion

The biennium just past has undoubtedly been the most active two year period in the history of this division. Work in large quantities and of almost every conceivable kind has crowded in from every part of the State, and particularly from counties just starting health work.

The division is seriously in need of two engineers, one to assist with the supervision of water works and sewage treatment plants, and one to undertake some systematic stream pollution work. There is also serious need for at least three additional sanitarians to more adequately carry on the sanitary work for the Board.

As already indicated, there is need for legislation which will provide for the licensing of water and sewage plant operators; for the better protection of our streams against pollution; for the protection of towns already treating their sewage from unwarranted damage suits, and a general sanitary enabling act providing for better roadside sanitation, as well as the sanitation of swimming pools, railway stations, bus stations, tourist camps, and schools.

DIVISION OF ORAL HYGIENE

The Division of Oral Hygiene of the North Carolina State Board of Health conducted Mouth Health Programs in the schools for forty-six county and three city units during the year 1936-1937 and in sixty county and four city units during the year 1937-1938. Work was also done in several orphanages and State institutions for children. Our records show that during these two years 117,762 underprivileged children had the necessary dental corrections made by the school dentists and that thousands of privileged children were referred to their own dentists.

In addition to the corrective work done, Mouth Health has been taught didactically by the dentists who have received special training for this phase of the work. An average of one thousand thirty-one children were taught in their classrooms by the school dentists each and every school day during the year 1937-1938.

One of the outstanding parts of our work for this biennium has been the working out of follow-up educational material to be used by the dentists in the classrooms. The teachers have been liberal in their endorsement of this material and the demand for it is steadily increasing. It has also received recognition from out of the State, California having requested copies to use in an exhibit at their State Dental Society meeting and Massachusetts having reproduced some of it in their handbook for teachers.

The puppet show continues to be one of our most popular activities. It is a visual means of teaching Mouth Health and of breaking down the children's fear of the dentist. During the last two years approximately one thousand children saw the show each school day.

At the meeting of the State Dental Society in Winston-Salem a resolution was passed commending the work of the Division of Oral Hygiene with a request that an exhibit, interpreting this Mouth Health teaching program, be prepared and displayed at the meeting of the American Dental Association in St. Louis. The exhibit is now being prepared. This is an honor not only to the Division of Oral Hygiene, but to the State Board of Health as well.

Concrete evidence of the lasting benefits of Mouth Health education was furnished by a check-up which was made in one of the counties this past year. Some individual blanks, recording dental corrections made for children several years ago, were sent back to the county so that the school dentist who had done this work could re-check the conditions of the children's mouths and also their progress in school. In practically every case, where the dental corrections had been made and diseased tonsils removed, there was decided improvement in the child's physical condition and in his school work.

Report of Dental Activity—Biennial Report**July, 1936, through June, 1938**

Total number children examined.....	242,654
Total number children treated.....	117,762
Total number children referred to local dentists for treatment	94,397

Amount and class of treatment itemized as follows:

Number amalgam fillings.....	74,527
Number cement fillings.....	13,436
Number silver nitrate treatments.....	193,040
Number teeth extracted.....	87,864
Number children—teeth cleaned.....	113,426
Number miscellaneous treatments.....	8,782
Total number operations.....	491,080
Number of children needing nothing done.....	40,495
Number lectures on Oral Hygiene.....	6,420
Total attendance at lectures.....	293,589
Number children taught Mouth Health through the Puppet Show.....	318,885
Total number children worked for who were repeaters	48,189

STATE LABORATORY OF HYGIENE

The biennial period July 1, 1936, to June 30, 1938, has witnessed another marked increase in the services rendered by the State Laboratory of Hygiene. More than 618,000 examinations of specimens were made during this period, an increase of more than 48 percent over the previous biennium. Although the growth in laboratory activities is encouraging evidence of more scientific application of public health knowledge, it carries with it the solemn reminder that laboratory facilities must be conserved. It is improbable that we will ever have the equipment or personnel which would make possible the examination of all specimens desired or the preparation of all biologics which would be used. Careful and intelligent discrimination by the users of laboratory service are definitely indicated in the selection of specimens to be sent to the laboratory and in their orders of the products of the laboratory.

In 1907 the need for water analysis of specimens from public and private water supplies was recognized by the General Assembly and laws were enacted creating the State Laboratory of Hygiene. From that beginning the State Laboratory of Hygiene has grown, but one of its major activities has always been the examination of specimens of water to determine the presence of dangerous contamination. These examinations have increased 28 percent during this biennium. Most of this increase was due to specimens from public supplies which have grown in number. The Laboratory has endeavored to discourage the sending of samples from open wells and unprotected springs, since all such sources are potentially dangerous. The facilities of the laboratory should be used only to reveal hidden or concealed sources of contamination. No sample should be sent from supplies where there is visible evidence of possible contamination. The sending of samples to the laboratory from open wells and unprotected springs is not only an unnecessary expense which serves no useful purpose but frequently does actual harm. The examination of approximately 20 percent of the samples from such sources will reveal no evidence of contamination. When an owner or user of a potentially dangerous water supply receives a laboratory report indicating that no contamination was found, a false sense of security is created. A feeling of security in the presence of danger is most unfortunate.

The Laboratory has endeavored to encourage the use of blood culture as an aid to diagnosis of those suspected infections in which bacteria occur in the blood stream. During the past two years 7,313 specimens of blood from patients suspected of having typhoid fever have been cultured. This represents an increase of 36 percent for the period covered by this report. Early diagnosis is most important in typhoid fever. The blood culture method is the best laboratory aid to early diagnosis. The typhoid bacilli occur in the blood stream during the first 10 days of the disease and can be isolated and identified by blood culture before they are excreted from the body of the patient.

When blood culture methods are used, typhoid fever can ordinarily be diagnosed sufficiently early in the course of the disease to make possible the inauguration of protective procedures which will prevent the occurrence of secondary cases. 528 specimens of blood examined during the biennium revealed the presence of typhoid bacilli. There can be no question that this work saved persons from developing typhoid fever. The medical profession has an increasing appreciation of the value of blood cultures in the diagnosis of other infectious diseases, there being an increase of 99 percent in the number of specimens sent to the laboratory for blood cultures other than that for typhoid fever.

Feces and Urine Cultures increased more than 32 percent during the period 1936-1938. It is believed that this laboratory procedure is now being used more effectively than it was in the past. Some few years ago it was the policy to send a specimen of urine and feces from each person who applied for a food handler's permit. The examination of these routine specimen was not only laborious but almost invariably failed to reveal carriers of infectious diseases. Health workers are now more inclined to use their epidemiological training and in so doing send five or more specimens from each person suspected of being a carrier of infectious agents instead of a single specimen from each applicant. By concentrating our efforts on suspected individuals our chances of finding carriers are markedly better.

Agglutination Tests are frequently distinctly helpful as laboratory aids to diagnosis. The Widal Test for typhoid fever has increased some 37 percent over the previous biennium. Although this test becomes positive late in the course of the disease, it is distinctly inferior to the blood culture method. It is helpful when the physician is called the first time after the patient has been sick for some two weeks. Until our people realize that it is important to call a physician early in the course of their disease, it will be necessary for the laboratory to do large numbers of Widal Tests.

The Weil-Felix Reaction is the laboratory aid for the diagnosis of Rocky Mountain Spotted Fever, Endemic Typhus and other diseases due to kindred organisms. 7,611 of these tests were made during this biennium, an increase of 30 percent. It appears that these diseases are increasing in number and that they are more widely distributed throughout the State.

Undulant Fever is still very much feared by the people in this State, there being an increase of 45 percent in the number of specimens sent to the laboratory for Agglutination Tests for this disease.

Tularemia, the so-called Rabbit Fever, is apparently increasing both in prevalence and in the minds of our people. There is an increase of more than 100 percent in the number of specimens sent to be examined for this purpose. The fact that 31 specimens gave positive reactions indicates that these fears are not without foundation.

Syphilis has been receiving increasing attention and is now recognized as one of our major public health problems. Serological tests for syphilis constitute approximately one-third of the activities of the

laboratory. During the past biennium 461,000 of these tests were made, an increase of 52 percent. In secondary and late syphilis these serological tests can be definitely helpful to the physician in making a diagnosis. For reasons of economy and efficiency the laboratory has changed its procedure in the making of these tests. Now each specimen sent to the laboratory is first examined by the Kline Test which is considerably more sensitive than our Wassermann Test. All those specimens giving positive or doubtful reactions are then subjected to our Wasserman Test. Since it is most important that these serological tests be standardized and that their efficiency be definitely determined, the laboratory has participated in Serodiagnostic Studies conducted by the United States Public Health Service. The study conducted in 1938 showed that our Kline Test was positive in 78.4 percent of the specimens from patients with syphilis and negative in 99 percent of the specimens from normal healthy individuals; whereas, our Wassermann Test was positive in only 45.1 percent of identical specimens and gave negative findings in 98 of 100 specimens from normal healthy individuals. Efforts will be made to increase the sensitivity of our Wassermann Test. The laboratory does not make a diagnosis. It only endeavors to supply evidence which will assist the physician in making a diagnosis. There is no ideal serological test for syphilis, since none will give positive reactions on all specimens from patients with syphilis nor be negative on all specimens from people who do not have that disease. It should be pointed out that it has been necessary for the laboratory to make more than 200,000 examinations per year in the same amount of space which was available when the normal work of the laboratory in this field of endeavor was some 75,000 specimens per year.

Microscopic Examinations have many fields of usefulness. The examination of specimens from patients with diphtheria showed an increase of 48 percent. This is due not only to the better appreciation of the importance to early diagnosis but also to the fact that we are now using more scientific methods in the management of diphtheria patients and carriers in that we are now using cultural release methods instead of the old quarantine method, assuming that all patients would be free of the infectious agent within three weeks from the date of onset. By cultural release many patients need not be isolated more than a few days; whereas, some will remain infectious for several weeks.

The Examination of specimens of sputum for the presence of tubercle bacilli shows 51 percent more than for the previous biennium. In this disease the hope for early diagnosis is based primarily upon tuberculin tests and x-ray examinations. Microscopic examination of specimens of sputum are now being used primarily for the detection of carriers and as a check on the progress of patients rather than as a diagnostic procedure.

Blood Smears for Malaria are 53 percent greater in this biennium than the previous one. 449 specimens showed malaria parasites as compared to 340 for the period 1934 to 1936.

Rabies is much less prevalent in North Carolina now than it has been at any time since 1932; consequently, the number of examinations of animal brains decreased some 37 percent. The records which we have concerning this disease indicate that its prevalence will decrease until 1940, after which time it will increase until about 1945. It is improbable that the present wave will fall as low as it did in 1931, since the dog population of the State is now probably greater than it ever was before and since there has been no tendency to keep dogs on the premises of their owners.

Vincent's Angina, according to the number of specimens for which this examination is requested, stands next to syphilis in the minds of our people, 27,600 specimens being examined for this condition, an increase of 49 percent.

Examinations for gonorrhea have increased 18 percent.

For some four years the laboratory has been trying to encourage the use of Darkfield method of examining specimens from patients suspected of having early syphilis. Although early diagnosis is important in practically every disease, it is of utmost importance in the case of syphilis. For the infected person early treatment based upon a proper diagnosis, offers the greatest hope of future well being. From the standpoint of preventing the spread of the disease, early diagnosis and proper treatment is essential, since the infected person cannot possibly spread the disease as much in a few days as he can in some two or three years. The Darkfield examination of specimens from suspected chancre is our most dependable aid in the diagnosis of syphilis. It offers us our only opportunity of making an early diagnosis. Suitable specimen containers make it possible for the laboratory to assist every physician in North Carolina, regardless of location, in making an early diagnosis of syphilis. It is distressing, therefore, that only 262 specimens were sent to the laboratory for this examination during this two year period. There is convincing evidence that we have more than 10,000 new syphilis infections each year or 20,000 during the biennium. Yet for only 262 of these was the State Laboratory of Hygiene given an opportunity to assist in making an early diagnosis. We do not feel that the medical profession is blamable for this condition. The most probable explanation is that infected patients do not call upon their physician for advice until they have passed from the primary stage into the secondary or late stages of the disease. If we are to make genuine progress in our efforts to control syphilis, we must have early diagnosis based on a Darkfield examination of Chancre Serum.

The Examination of Spinal Fluids is generally associated with the prevalence of infections of the central nervous system. During the past biennium we experienced an epidemic of poliomyelitis. During this biennium we have had numerous outbreaks of meningococcus meningitis and the usual number of pneumococcus meningitis, tuberculosis meningitis, etc.

Intestinal Parasites are still a problem in North Carolina. The number of examinations made increased 29 percent during the period

covered by this report, more than 14,000 specimens of feces having been received. 1,600 or approximately 11 percent showed some type of intestinal parasite, the hookworm being the most prevalent.

We have continued our efforts to discourage the making of urine analyses, since we do not consider it a proper function of our laboratory. Such examinations as have been made were for the purpose of accommodating the older practitioners in the rural communities.

Animal Inoculations for tuberculosis have increased some 46 percent; whereas, animal inoculations for rabies have decreased some 49 percent.

Miscellaneous examinations have increased 33 percent.

Of the products manufactured and distributed by the laboratory there has been definite decrease in the amount of Tetanus Antitoxin. Since the laboratory has not been able to install new equipment in its old plant, the commercial biologic houses by improving their product and decreasing the price have been able to sell a more refined and more concentrated antitoxin than we are equipped to prepare. Since it is primarily the purpose of the laboratory to control the price rather than to sell the product, we are not displeased with the situation.

Distribution of Diphtheria Antitoxin has increased over the previous biennium. The 5,000 Unit Package has been discontinued, since it frequently was used for the treatment of patients and tended to encourage the use of inadequate doses. The quantity of Schick Test material distributed has remained practically constant notwithstanding our recommendation that all persons receiving diphtheria toxoid should be tested for immunity. We cannot expect more than 90 percent of the children to whom diphtheria toxoid is administered to develop sufficient immunity to keep them from having diphtheria. The Schick Test should be used much more frequently.

It is encouraging to note that more smallpox vaccine is being distributed. There is evidence, however, that we have a constantly increasing proportion of our population susceptible to smallpox.

With the decrease in the prevalence of typhoid fever our people lose their fear of the disease and fewer of them avail themselves of the protection given by typhoid vaccine. The decrease in its use is approximately 18 percent as compared with the previous biennium.

The decrease in the prevalence of rabies accounts for the reduced number of anti-rabic treatments supplied.

There is an increasing number of people who feel that Pertussis Vaccine affords some protection to Whooping Cough.

The amount of diphtheria toxoid distributed is slightly less than for the previous biennium. North Carolina is not making the desired progress in controlling this unnecessary killer of children. Diphtheria is one disease in which we have no hope of economy, either we spend our money for diphtheria toxoid with which to immunize our children or we spend it for diphtheria antitoxin for the treatment of those who become infected.

Our growing interest in the control of syphilis is reflected

dramatically by the increase in the number of anti-syphilitic drugs distributed. Since a large volume of these therapeutic agents will be distributed free of cost by the Division of Epidemiology, it is highly probable that the sale of these products by the laboratory will be decreased during the coming biennium.

The financial statement shows an increase in expenditures of approximately 22 percent. Since the major activities of the laboratory have increased more than 40 percent the 22 percent greater cost of operation seems more than justified.

The outstanding accomplishment of the laboratory during the present biennium was the sale of \$160,000.00 worth of Revenue Bonds, authorized by the 1937 General Assembly for the purpose of providing the laboratory with a new plant. This together with a P. W. A. Free Grant of \$130,909.00 will provide a central building on Caswell Square, adjacent to the present State Board of Health Building. At this central laboratory examinations of specimens from patients will be made and biologics will be standardized, tested for sterility and made ready for distribution.

A laboratory farm has been purchased five miles west of the City of Raleigh on U. S. Highway Nos. 1, 64 and 70. On the farm will be constructed horse barns, operating rooms and small animal houses. Here preliminary preparation of biologics will be carried on. It is hoped that most of the small animals needed by the laboratory can be produced on this farm and that the larger portion of the feeds needed for all animals can be grown here.

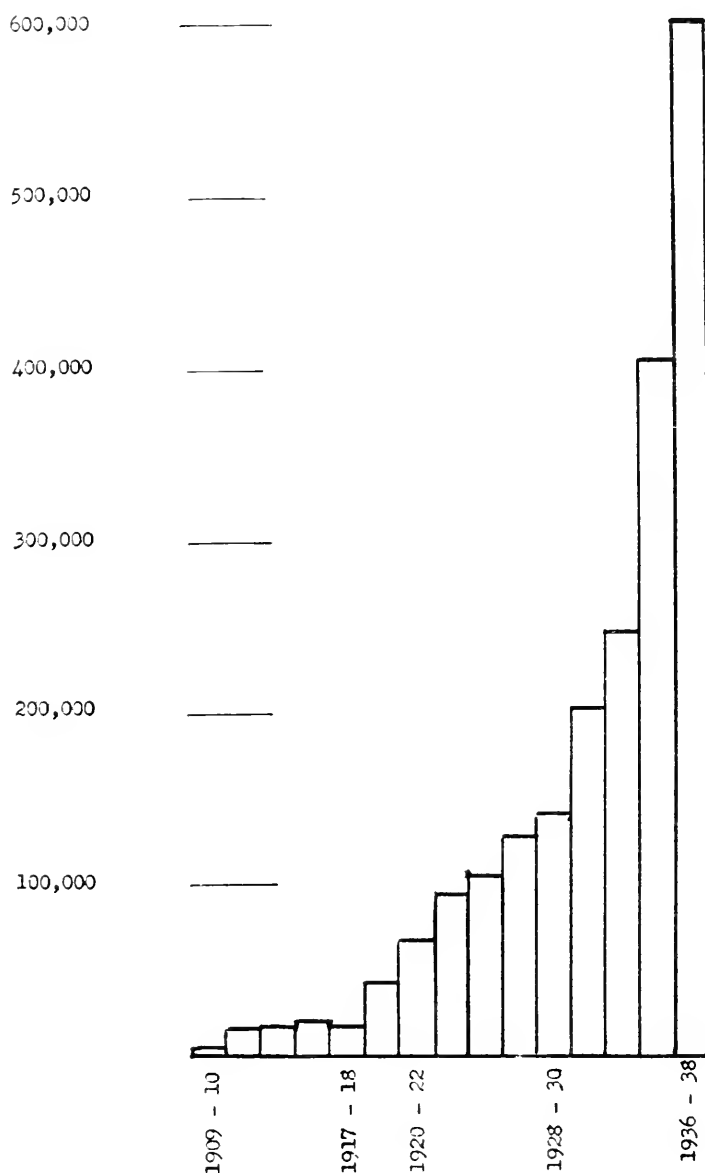
This new Laboratory Plant has been desperately needed for several years. It will make possible an extension in the service of the laboratory. Since the bonds issued are Revenue Bonds, it will be necessary that receipts of the laboratory be increased so that there will be sufficient revenue to retire the bonds. As soon as the new plant is completed new products will be available. In the meantime, it has been suggested that the laboratory make a charge for specimen containers. Since approximately 350,000 of these specimen containers are distributed each year, a charge of from five to ten cents for each container would yield sufficient revenue to provide adequate debt service. It is proposed that the laboratory charge only the actual cost of the specimen container. Since from 25 to 30 percent of these containers are not used for the purpose of sending specimens to the State Laboratory of Hygiene, there is considerable justification for charging actual cost for them.

At present the laboratory facilities of the State are inadequate to meet the needs of our public health program. It is highly desirable that competent local laboratories be available. It is our hope that we can encourage the development of local laboratories and that we can assist in improving the quality of their service. It would seem that the demand for laboratory service will always be in excess of our ability to supply it. We should, therefore, use our laboratories intelligently and make every effort to conserve these facilities. If we are to get the best work from our laboratories, we must not send to them

specimens, the examination of which can reveal no useful information. In this field of endeavor as in others we need quality more than quantity.

Our staff has been loyal under trying circumstances. Often the laboratory has been literally swamped with work, yet only occasionally has it been necessary to delay our examinations or to postpone the filling of an order for supplies. Only a competent and spirited staff could uphold the tradition of the laboratory under the handicaps of the past two years. With more adequate space and modern equipment the laboratory will endeavor to render commensurate service.

EXAMINATION OF SPECIMENS BY STATE LABORATORY OF HYGIENE
FOR BIENNIAL PERIODS 1909 to 1938



STATE LABORATORY OF HYGIENE, RALEIGH, N. C.

REPORT OF EXAMINATIONS MADE

	July 1, 1936—June 30, 1938				July 1, 1934, to June 30, 1936—Total
	Positive	Negative	Unsatis- factory	Total	
Water Analyses					
Bacterial & Chemical.....				15,915	12,434
Blood Cultures Typhoid.....	528	6,768	17	7,313	5,354
Other Blood Cultures.....				1,376	690
Feces & Urine Cultures.....	377	4,518		4,895	3,706
Agglutination Tests					
Macro Typhoid Widal.....	371	10,428	6	10,805	7,880
Weil Felix, Reaction.....	255	7,355	1	7,611	5,090
Undulant Fever.....	85	7,551		7,636	5,231
Tularaemia.....	31	490		521	47
Dysentery.....				107	
Serological Tests for Syphilis.....				461,036	301,792
Microscopic Examinations					
Diphtheria.....	1,083	14,551	7	15,641	10,549
Tuberculosis (Sputum).....	2,560	14,497	70	17,127	11,331
Malaria (Blood Smears).....	449	3,544	22	4,015	2,608
Rabies (Animal Brains).....	722	1,517	70	2,309	3,738
Vincent's Angina.....	10,426	17,244		27,670	18,533
Gonorrhea.....	3,690	13,579	20	17,289	14,615
Darkfield (Chancere Serum).....	47	167	48	262	77
Spinal Fluid.....				397	388
Feces, Intestinal Parasites.....	1,668	12,567	80	14,315	10,241
Urinalyses.....				113	127
Animal Inoculations					
Tuberculosis.....				60	41
Rabies.....				246	485
Miscellaneous.....				1,909	1,431
Total.....				618,568	416,388

STATE LABORATORY OF HYGIENE, RALEIGH, N. C.
REPORT OF BIOLOGICS DISTRIBUTED

	July 1, 1936, to June 30, 1938	July 1, 1934, to June 30, 1936
MANUFACTURED BY THE STATE LABORATORY OF HYGIENE.		
Tetanus Antitoxin.		
1,500 Unit Packages	11,584	17,810
5,000 Unit Packages	469	549
Diphtheria Antitoxin:		
1,000 Unit Packages	741	596
5,000 Unit Packages	532	730
10,000 Unit Packages	13,341	11,918
Schick Tests for Diphtheria:		
50 Tests Packages	4,149	4,119
Schick Control for Diphtheria:		
50 Tests Packages	654	848
Smallpox Vaccine:		
Individual Tubes	109,020	92,474
50 Dose Vials	7,366	6,328
Typhoid Vaccine:		
3 cc Vials	13,157	17,404
10 cc Vials	166,876	200,710
Rabies Treatments (Complete—21 doses each)	1,604	4,071
Pertussis Vaccine:		
5 cc Vials	4,390	4,938
10 cc Vials	6,079	4,709
Autogenous Vaccine	140	166
Bacterial Cultures	20	59
THE FOLLOWING ARE BOUGHT AND DISTRIBUTED AT COST:		
Diphtheria Toxoid:		
1 cc Vials	3,140	2,305
3 cc Vials		387
10 cc Vials	15,396	16,563
Diphtheria Toxin Antitoxin:		
3 cc Vials		106
10 cc Vials		125
Neosarsphenamine & Sulpharsphenamine:		
0.1 Gram Ampules	488	254
0.2 Gram Ampules	1,075	495
0.3 Gram Ampules	863	600
0.4 Gram Ampules	2,149	1,126
0.6 Gram Ampules	141,969	74,079
0.9 Gram Ampules	48,607	29,910
4.5 Gram Ampules	13,041	1,805
Distilled Water:		
10 cc Vials	117,932	69,764
20 cc Vials	7,909	-----
Scarlet Fever Antitoxin:		
Prophylactic Syringes	21	44
Therapeutic Syringes	14	4
Dick Test for Scarlet Fever	1,720	1,850
Blanching Test for Scarlet Fever	210	160
Erysipelas Antitoxin (Syringes)	80	86
Antivenene (Syringes)		4
Meningitis Serum (Syringes)	22	63
Bismuth Tartrate:		
20 cc Vials	3,449	931

STATE LABORATORY OF HYGIENE
EXPENDITURES

	July 1, 1936, to June 30, 1938	July 1, 1934, to June 30, 1936
Salary—Director.....	\$ 10,708.00	\$ 9,500.01
Salary—Staff.....	96,612.64	74,432.65
Salaries—Extra.....	2,214.73	2,425.08
Office Supplies.....	809.02	509.95
Occupancy Supplies.....	500.03	445.31
Scientific Supplies.....	77,850.01	62,288.03
Fuel.....	531.25	535.45
Agricultural Supplies.....	5,810.55	5,073.01
Postage and Box Rent.....	11,544.14	9,462.58
Telephone & Telegrams.....	91.13	79.86
Freight & Express.....	1,018.42	1,009.97
Travel Expense.....	327.82	703.11
Motor Vehicles Operation.....	1,790.72	1,583.38
Repairs Equipment.....	717.40	1,506.57
Repairs Building.....	583.88	2,361.67
Printing and Binding.....	1,795.98	1,407.52
Light, Power, Water.....	3,402.99	3,919.24
General Expense.....	36.51	184.02
Office Equipment.....	1,376.93	622.52
Scientific Equipment.....	1,955.18	1,458.82
Insurance and Bonding.....	471.38	511.75
Imprest Cash.....		
Workmen's Compensation.....	35.00	229.00
Total.....	\$ 220,183.71	\$ 180,249.50

STATE LABORATORY OF HYGIENE
RECEIPTS

	July 1, 1936, to June 30, 1938	July 1, 1934, to June 30, 1936
BIOLOGICS MANUFACTURED IN STATE LABORATORY OF HYGIENE:		
Diphtheria Antitoxin.....	\$ 4,430.61	
Tetanus Antitoxin.....	7,419.13	
Rabies Treatments.....	7,022.24	
Autogenous Vaccine.....	597.50	
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	\$ 19,469.48	\$ 34,165.44
ARTICLES BOUGHT AND DISTRIBUTED AT COST:		
Diphtheria Toxoid.....	\$ 16,493.74	
Neosarsphenamine.....	27,149.92	
Distilled Water.....	6,353.09	
Scarlet Fever Antitoxin.....	118.50	
Dick Test.....	37.01	
Blanching Test.....	10.00	
Erysipelas Antitoxin.....	373.80	
Meningitis Serum.....	126.00	
Bismuth Tartrate.....	1,653.96	
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	52,316.02	32,312.54
TOTAL	\$ 71,785.50	\$ 66,477.98
Refunds	1,009.29	950.44
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NET TOTAL	\$ 70,776.21	\$ 65,527.54
Water Tax	31,006.71	27,579.95
Special Fees	182.00	251.50
Miscellaneous	1,326.86	1,214.45
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TOTAL	\$ 103,291.78	\$ 94,573.44

FINANCIAL STATEMENT

Total Expenditures.....	\$ 220,183.71	\$ 180,249.50
Total Receipts.....	103,291.78	94,573.44
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Appropriation.....	\$ 116,891.93	\$ 85,676.06

DIVISION OF EPIDEMIOLOGY

This Division has carried on its usual functions during the biennium. Office routine has consisted of: (1) recording and analyzing daily reports of various communicable diseases forwarded to this office by physicians of the State; (2) preparation of spot maps, charts and graphs to visualize the distribution of cases over the State and their relation to incidence in former years; (3) preparation of weekly bulletins showing distribution of eleven principal diseases, as reported by county and larger cities. Syphilis has been added to this report as the eleventh disease, because of the increased interest in the location of venereal disease in our State. This weekly report is mailed to all health officers and others interested in this reporting; (4) preparation of a monthly analytical report showing status of infectious diseases for the State as a whole; (5) preparation of a weekly telegram and monthly report for the Surgeon General of the U. S. Public Health Service, giving incidence of reportable diseases; (6) distribution of blank forms, placards and informative literature pertaining to communicable disease control; (7) analysis of reports for age and sex distribution for typhoid fever, poliomyelitis, pellagra, diphtheria, scarlet fever, measles, etc.; (8) checking of death certificates for completing case reporting; (9) keeping an investigation record of each typhoid fever case for the purpose of correlating the incidence with the sanitary status of the area in which it occurs; (10) analysis of the monthly clinic reports from 120 venereal disease clinics throughout North Carolina in the preparation of a monthly summary of this activity for the Public Health Service.

Special investigations of any unusual incidence of a disease are made by the Director of the Division upon the request of the local health officer or, if the epidemiological character of the disease is not well understood, investigation is often made upon appearance of the first case in a community. Records of case incidence for the entire State are kept in this Division and the Director is therefore in position to estimate prevalence and to know when epidemic proportions are reached. The fact that reporting is rather incomplete increases the difficulties of such estimation.

INCIDENCE: Herewith is given the incidence by month of reported diseases for the calendar year 1937 for the State as a whole:

During the biennium the incidence of *typhoid fever* showed a decline in comparison with the previous biennium. There was a slight decrease in the number of reported cases of *diphtheria* in the last half of the biennium as compared with the first half. *Measles* incidence rose sharply in the latter part of this period. The geographic distribution of *Rocky Mountain spotted fever* and *endemic typhus fever* shows a slight increase. The incidence of *Rocky Mountain spotted fever*, as reflected in reports to this Division, has not increased in this biennium, but the reported incidence of *endemic typhus fever* increased considerably in 1937 over the previous year. Malaria was made a reportable disease to this Department in May, 1937; hence the reporting of this disease for the remainder of the biennium is rather incomplete, and cannot yet be taken as a very accurate indication of the malaria problem in this State.

REPORTABLE DISEASES—REPORTED CASES BY MONTHS—1937

DISEASE	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Anthrax.....													
Chancroid.....	148	13	23	17	17	7	9	7	13	9	10	14	9
Chicken Pox.....	5,409	671	614	819	699	418	211	68	25	14	198	659	1,013
Cholera.....													
Dengue Fever.....													
Diphtheria.....	2,056	168	113	64	61	49	46	43	94	357	504	387	170
Dysentery (Bac.).....	19	1			3		4	1		8		2	
Endemic Typhus.....	68	4	6	3	5	1	4	10	5	4	5	13	8
German Measles.....	2,855	93	109	700	1,085	690	76	20	5	7	15	20	35
Gonorrhea.....	2,877	211	248	202	214	239	220	193	335	262	303	266	184
Influenza.....	1,979	231	408	956	243	48	17				2	16	12
Malaria.....	876					1	32	52	174	313	204	76	24
Measles.....	7,937	273	336	593	860	1,104	1,169	379	130	94	276	819	1,904
Meningitis.....	169	13	13	20	32	22	13	11	11	7	6	11	10
Ophthalmia N.....	17	2		2	2	1	3	2		2	1	1	1
Para-Typhoid F.....	16			1	1	1	2	4	1	2		4	
Pellagra.....	576	11	39	22	43	65	119	91	42	45	34	35	30
Plague.....													
Poliomyelitis.....	106	2	2	2	1	3	14	30	23	12	11	6	
Psittacosis.....													
Rabies.....	2		1				1						
Rocky Mt. Sp. F.....	27						4	11	6	3	1	1	1
Scarlet Fever.....	2,073	216	172	167	162	130	67	63	82	184	301	288	241
Septic Sore Throat.....	125	12	4	10	6	8	4	3	11	12	20	20	15
Smallpox.....	11	2	1	1	3		1	1			1		1
Syphilis.....	12,299	506	847	1,049	1,201	1,005	1,143	1,049	1,179	1,383	1,161	1,030	746
Trachoma.....													
Tuberculosis.....	2,632	107	220	176	155	204	135	239	421	310	304	236	125
Tularemia.....	13	4	3	1		1	2		1				1
Typhoid Fever.....	493	22	17	11	16	14	30	106	99	64	46	51	17
Typhus (Europ.).....													
Undulant Fever.....	26	2	4	3	1	2		5	2	4		3	
Whooping Cough.....	7,782	259	394	542	529	705	1,013	1,165	720	483	401	682	889
Yellow Fever.....													
TOTALS.....	50,591	2,823	3,574	5,361	5,339	4,718	4,339	3,553	3,379	3,581	3,818	4,636	5,470

The number of lectures on general health subjects as well as radio talks and newspaper articles released from this Division has greatly increased in this biennium. The Division has continued to prepare and distribute each year a morbidity report for North Carolina which contains various tabulations of the reported cases of communicable diseases. This report is sent to a mailing list that contains the names of every health officer in the State, every State health department in the United States, every medical college library, many university and hospital libraries, numerous private physicians and educators, the Library of Congress and to a number of foreign countries.

Immunization in the State was carried on by full-time county, city or district health departments or by local physicians in counties without full-time health service; in the latter instances such work is financed by local funds. The State Board of Health has no appropriation to carry on this work on a State-wide basis.

During the biennium quarantine reports from all counties without full-time health service have been checked against disease records and certified to by this Division. The quarantine officer in each of these counties is paid on a fee basis by a schedule based upon the population of his county. Payment is made to him by the county according to certification received from this Division.

VENEREAL DISEASE CONTROL. During the first quarter of this biennium plans were laid for the coming venereal disease control program. Public interest was aroused by a program of newspaper publicity, radio talks, articles for various publications, which laid the foundation for the control program yet to come. As the first specific step in this program a Venereal Disease Consultant was employed in October 1936 to direct the work. It was felt that an educational campaign to acquaint the public with the facts of this problem and the necessity for its control was the logical way to begin. The Venereal Disease Consultant, therefore, devoted his time to giving illustrated lectures on the venereal diseases, using suitable motion picture films on this subject. These were presented before high school and college groups as well as various civic organizations throughout North Carolina, such as P. T. A., Woman's Clubs, Businessmen's Clubs, etc. In cooperation with the State Department of Public Instruction a series of conferences with science teachers was held at various points in the State. Others interested in this problem were invited to attend. These conferences were held for the purpose of integrating information on sex hygiene with the public school curriculum.

The 1937 General Assembly appropriated \$25,000 for venereal disease control, specifying that \$10,000 of this amount was to be used for the purchase of drugs. These drugs were purchased and their distribution begun immediately.

During the biennium the Venereal Disease Consultant studied for a year at Johns Hopkins in Syphilology. In order that the activities of this Division formerly carried on by him should not be curtailed, the U. S. Public Health Service assigned one of its regular staff members to North Carolina to act as Venereal Disease Consultant.

Most of his time was spent in supervising the work of the clinics already in operation and in aiding in the establishment of other venereal disease clinics. He has obtained much valuable data necessary in the standardization of clinic procedure throughout the State. At the end of the biennium the Venereal Disease Consultant returned to this Division from Johns Hopkins and the Acting Venereal Disease Consultant was allowed by the Public Health Service to remain in this State for the present in the capacity of an Associated Consultant in Venereal Disease Control.

In December 1937 the North Carolina State Board of Health received from the Zachary Smith Reynolds Foundation of Winston-Salem, N. C., the gift of \$100,000 for venereal disease control in North Carolina. The staff of the State Board of Health and the Trustees of the Foundation together developed plans for the administration of this fund which met with the approval of the Foundation Trustees. A great amount of activity in the work of this Division was created by the announcement of this gift, both in field work for the Director and work in the Central Office. Sixteen local health departments met the requirements necessary to participate in this fund and in these departments a syphilis control program considered adequate is now in progress. The health jurisdictions of these departments provide this type of service to approximately one-third of the population of North Carolina.

Just before the end of this biennium there was enacted by Congress the LaFollette-Bulwinkle Bill, which carries an appropriation by Congress of three million dollars for venereal disease control to the various states of the Union. North Carolina will share in this fund and a program of venereal disease control for those counties with full-time health service who are not participating in the Smith Reynolds fund and who will meet the requirements laid down by the U. S. Public Health Service for an adequate program of this kind, will be developed in the beginning of the coming biennium.

The close of the last biennium witnessed the operation of 41 venereal disease clinics in connection with local health departments. That number has increased so that there are 120 such clinics in operation in the State at the end of this biennium. The increase in the reporting of syphilis in this biennium has kept pace with the expansion of clinic facilities, e.g., the increase in the number of reported cases of syphilis in the present biennium as compared with the last biennium is approximately 152.8 percent.

A Malaria Investigation and Control Unit was established in this Division July 1, 1937, consisting of one engineer, one entomologist and two laboratory technicians. Its primary objectives are to locate by recognized scientific practices all of the malaria foci within the State; to determine the cause of the malaria within each focal area; to formulate the most practical plan for the control of malaria within each area; and to supervise the application of control measures when they are put into operation.

The Unit operates in accordance with a standard plan. Before a

survey is made the local health officer agrees to take blood slides from all school children through the first six grades. These slides are examined by the laboratory technicians. Special maps are prepared by the engineer for each area of high incidence, showing by a colored symbol the home of each child whose slide shows positive for malaria. The density of the symbols establish the foci. The special maps show all homes, roads, ponds, streams and other topographical features, a symbol showing the presence or absence of malaria in each home. Each house is also classified according to the degree of protection afforded against mosquitoes and its type shown by a symbol on the map. The entomologist makes a detailed survey of the mosquitoes breeding within the area. All places breeding *Anopheles quadrimaculatus* are established. The engineer and entomologist together determine the control plan best adapted to the particular area. Draining or filling are recommended wherever the breeding place can be destroyed in this way. When the area is not too large breeding can be controlled by the application of oil, Paris green or other larvicides. In areas where it is not feasible to control the breeding of anopheles mosquitoes well screened homes will greatly reduce the amount of malaria.

In May 1937 the State Board of Health adopted regulations governing the impounding of waters. No pond can be built in the State without a permit which embodies an agreement to conform with these regulations both in the construction and maintenance of the pond. These permits are issued by the engineer of this Unit and periodic inspections made to see that ponds are maintained so as not to become hazards to the public health.

From July through September 1937 the Unit personnel attended a school sponsored by the U. S. Public Health Service where a course in malariology was given under the auspices of the Public Health Service at Savannah, Ga., the Rockefeller Foundation at Tallahassee, Fla., and the Tennessee Valley Authority at Wilson Dam, Alabama. Upon their return from school this personnel took approximately 10,000 blood slides in two counties. The malaria areas have been mapped and control activities for those areas have already begun.

The Unit has been very active in promoting and supervising control measures in urban communities. A number of towns have passed ordinances which were recommended and provided inspectors to see that they are enforced. These ordinances prohibit the maintenance of places which breed mosquitoes on private premises. The same towns are conducting larvicide programs with very gratifying results.

On all of the major hydro-electric developments within the State control measures are carried out on the reservoirs to prevent the breeding of malaria mosquitoes. This Unit assists the power companies in conducting their operations by making inspections and recommendations. It is believed that by establishing the malaria foci this Unit will make all future control work more effective and will furnish means by which work done can be evaluated with a fair degree of accuracy.

DIVISION OF VITAL STATISTICS

The activities of the Bureau of Vital Statistics have increased greatly during the present biennium. The additional purposes to which birth and death certificates are being put has almost doubled the demand for verifications of age and for certified copies of certificates. This together with the requirements that the certificates be complete, whenever it is possible to secure all the data, legible, and have affixed the signature of the attendant in case of birth certificates, and the additional number of tabulations done account for the increased amount of work.

The Bureau of Vital Statistics has certain assigned duties to perform. These include the collection, editing, filing, indexing and tabulation of over 112,000 birth and death certificates yearly. These are received at the approximate rate of 6,400 birth and 3,000 death certificates monthly.

The fundamental features of our system of registration of births and deaths are: First, each city, each incorporated town, and each township constitute a local registration district. The State Board of Health has authority to abolish or consolidate these local registration districts. Such consolidations have been made frequently in the case of small incorporated towns, the towns being consolidated with the township district. The whole-time health officer of a county may be designated registrar for that county by the State Board of Health if it is decided advisable for reasons of economy or efficiency in registration. When the health officer is appointed local registrar for the entire county the fees formerly used to pay township registrars must go into the budget of the County Health Department to be used for health service. This consolidation has been made only with the consent of local authorities. The following counties register births and deaths under this plan: Anson, Chowan, Cumberland, Forsyth, Franklin, Hertford, Lenoir, Stokes, Wake, Wayne and Yadkin.

Second, with the exception of counties in which the health officer has assumed the duties of local registrar, township registrars are appointed by the chairman of the board of county commissioners of the respective counties, and the town and city registrars by the mayor of the municipality. It is the function of the local registrar to carefully examine each certificate of birth or death presented for record, in order to ascertain whether or not it has been made out in accordance with the provisions of the Vital Statistics Law and the instructions of the State Registrar; and if any certificate is incomplete or unsatisfactory, it is his duty to require its satisfactory completion before registering it. After making a copy of each certificate the local registrar forwards the original to the State Board of Health on the fifth of each month. At the same time he sends a list of the certificates registered with him to the County Health Officer.

Third, the doctor or midwife who attends a birth must file a birth certificate with the local registrar within five days after the birth

occurs. In case the infant is born dead it is recorded as a birth and also as a death, but only one certificate, which is completed by the physician and the undertaker is required.

Fourth, the undertaker or person acting as undertaker is responsible for filing the death certificate. He must secure the personal and statistical particulars concerning the deceased from the person best qualified to supply them, and present the certificate to the attending physician for certification of cause of death. The completed certificate is filed with the local registrar in order to obtain a permit for burial, removal or other disposition of the body.

Upon receipt of the certificates by the Bureau of Vital Statistics they are carefully examined for completeness and for conformity of data. Numerous personal and form letters and hundreds of amendment certificates are required to be sent monthly in order to complete the certificates satisfactorily. The certificates are tabulated, bound, indexed, and stored in a fire-proof vault. In order to be able to locate any certificate when called upon to do so they are coded and indexed by name according to the Russel-Soundex system. Current certificates are indexed on cards which are then mounted on visible panels. Later these panels are photographed and the photographs are bound in volume form for the permanent index.

In addition to the routine collection of certificates and securing their correction and completion, the activities of the Bureau of Vital Statistics include the tabulation and publication of mortality statistics. Detailed final tabulations are published in manual form yearly, and provisional monthly reports are made. Federal funds made available by the Social Security Act has permitted an increase in the service rendered by making it possible to employ four additional clerks.

The Bureau of Vital Statistics has begun sending Notification of Birth Registration certificates. These certificates are furnished by the United States Census Bureau and are mailed under the franking privilege. The notifications are an attractive certificate and informs the parents that the child's birth has been registered with the Bureau of Vital Statistics. It will serve in every instance when verification of age, names of parents, and place of birth is desired.

North Carolina was one among the first of the Southern States to be admitted to the United States Registration Area, being admitted for deaths in 1916 and for births in 1917. As a member of the Registration Area transcripts of all births and deaths are required to be sent to the Bureau of the Census, for which a fee sufficient to cover the cost of transcribing is paid. In addition to the fee paid the Bureau of Vital Statistics has the privilege of franking much of the correspondence.

The Bureau is making every effort to secure complete registration. These records are of value to the individual and as an index to the health of our citizens. To the individual a birth certificate will furnish proof, which will be accepted in every civilized nation on earth, of the place of birth, the time of birth, and parentage. The place of birth as recorded on the birth certificate may be used to establish citizenship or place of residence. It is necessary in order to obtain a passport.

The time of birth may be used to prove age, to obtain admission to school, to establish the right to work, to qualify for Civil Service examination, to hold public office, to establish the right to vote, to obtain a marriage license, to determine legal responsibility, or to prove qualification for or exemption from civil and military duty. Parentage, as stated in the birth certificate, is necessary to establish the right to inherit or bequeath property, to establish identity, to obtain settlement of insurance, to prove that parents have dependent children, to prove legitimacy or to furnish acceptable evidence of genealogy.

Death certificates may be used by individuals to furnish evidence in court, to secure pensions or life insurance, to establish titles and right of inheritance, or to give homeseekers and immigrants a guidance in selecting safe and healthful homes.

In organizations interested in health problems and procedures, birth and death records are used to determine the magnitude of health hazards, to plan new activities, to prevent epidemics, and to evaluate procedures. Since we use these records as a yard-stick for measuring our problems and progress it is essential that they be accurate.

The birth rate of 22.1 per 1,000 population in 1936 was the lowest ever recorded in North Carolina. In actual numbers there were 3,275 fewer births than in 1935. However, in 1937 the birth rate showed an increase to 23.1, representing a total of 80,644 or 4,323 more than in 1936. When taken over several years the birth rate shows a gradual decline in agreement with decreases throughout the United States.

The health conditions in North Carolina for 1936 as indicated by the death rate were, in general, not so favorable as for the preceding year. There were more deaths recorded from all causes combined, and consequently a higher death rate than for 1935. The 35,580 deaths, exclusive of stillbirths, represents an annual death rate of 10.3 per 1,000 population. The record for 1937 was more favorable with a total of 34,100 deaths being reported, or 1,480 fewer than for 1936. This gave a rate of 9.8 deaths for every 1,000 population.

When the deaths from all causes are analyzed it is discovered that the largest proportional increase in 1936 over 1935 occurred among the group of degenerative diseases. This group—heart disease, chronic nephritis, cerebral hemorrhage, cancer, diseases of the arteries, diabetes, and angina pectoris—seven in all, accounted for 14,925 deaths in 1936, or 42 per cent of the deaths from all causes. The increase in number of deaths from degenerative diseases was more than enough to offset the decrease in infectious, contagious and other causes.

When specific causes of death are considered it is found that the death rates from typhoid fever, tuberculosis and most other preventable causes have continued to decrease. No death has been reported as due to smallpox for the past six years. The peak year for pellagra deaths occurred in 1930 when a rate of 32 deaths was recorded for each 100,000 population. There has been a successive decline in the mortality every year since with a rate of 9.4 for 1937. Diarrhea and enteritis, a principal cause of death in 1914, is tenth at present, the

rate of approximately 33 per 100,000 population being only one-third of what it was in 1914.

Violent and accidental deaths increased in 1936. Automobile accidents accounted for the greatest number, there being 1,006 deaths from all types of automobile accidents in 1936 and 1,043 in 1937.

It is important, both to the individual and to health organizations, that we have complete and acceptable records of all births and deaths which occur in the State. We can only attain that objective when physicians, undertakers, midwives, registrars, and other individuals do their part. Since birth and death certificates are important documents, it is essential that we have the legal signatures of physicians, midwives, and registrars. If everyone who has responsibility in connection with birth and death certificates will give the consideration to these documents which their importance deserves, we can have records which will fill the needs of individuals and which will make health protection more effective.

DIVISION OF COUNTY HEALTH WORK

At the beginning of the biennium July 1, 1936, there were fifty-four counties and four cities operating full-time local health services in which the North Carolina State Board of Health and/or Federal Agencies were assisting financially. Of this number fifty-five were under the direction of full-time health officers and in the remaining three the service was carried on under the immediate supervision of a nurse, sanitary inspector, or other health personnel.

The following is a chronological list of full-time health services established during the biennium:

July 1, 1936—Craven County (reorganized under direction of full-time health officer.)

July 1, 1936—Hertford County.

January 1, 1937—Bladen County (reorganized.)

June 16, 1937—Cherokee and Clay Counties (in district health service with Graham.)

July 1, 1937—Nash County (reorganized with full-time director.)

July 1, 1937—Burke and Caldwell Counties (district health unit.)

July 1, 1937—Greene County (with Edgecombe in district health service.)

July 1, 1937—Transylvania County (as a part of the Haywood-Jackson-Swain-Macon District Health Unit.)

July 1, 1937—Stanly County.

July 1, 1937—Hyde, Tyrrell, and Washington Counties (district health unit.)

August 16, 1937—Dare County (added to Hyde-Tyrrell-Washington District Health Unit.)

September 1, 1937—Chowan County (with Bertie in district health service.)

October 1, 1937—Chatham County (with Orange and Person Counties in district health service.)

December 16, 1937—Johnston County (reorganized.)

January 1, 1938—City of High Point (reorganized under direction of full-time director.)

January 1, 1938—Anson County

February 1, 1938—Martin County.

During the biennium Pamlico and Polk Counties were discontinued as recipients of State Aid. This was made effective in Polk County on July 1, 1936, and in Pamlico County on July 1, 1937.

During the biennium funds have been available from the United States Public Health Service and the Children's Bureau for supplementing State Aid, making possible the organization of the new health service enumerated above and the strengthening of existing health services.

During the period July 1, 1936, to June 30, 1937, the sum of \$209,605.53 was available to the local health departments from

agencies other than local and State. During the fiscal year 1937-38 there was available from sources other than local or State the sum of \$267,474.16 for local health work in North Carolina.

At the end of the biennium on June 30, 1938, public health service is in operation in sixty-eight counties and five cities receiving financial aid through the North Carolina State Board of Health and/or Federal Agencies. This service is rendered by fifty-nine health officers, six assistant medical officers, five dental officers, one hundred and ninety-seven public health nurses, one hundred and five sanitation personnel, thirteen laboratory technicians, eighty-four clerk-stenographers, and there were 1,065 weeks of dental service provided in counties and cities having full-time organized public health services, this dental service being available to these counties and cities through the Division of Oral Hygiene of the North Carolina State Board of Health.

The per capita cost of health service in fifty-one counties with full-time health departments during the fiscal year 1936-37 was .398 as compared with .315 for the fiscal year 1935-36. The per capita cost for nursing or sanitary inspection health service in counties having this service alone during the fiscal year 1936-37 was .126, a decrease of .039 over the .165 for the fiscal year 1935-36. The per capita cost of health service in sixty-seven counties with full-time health service during the fiscal year 1937-38 was .419. The per capita cost in nursing or sanitary inspection counties having only this type of service for the fiscal year 1937-38 was .121. The per capita cost of health service in four city health departments during the fiscal year 1936-37 was .829. The per capita cost of health service in five city health departments during the fiscal year 1937-38 was .877.

During the biennium all new public health workers were required to take courses of training to qualify them for service in the public health field. During this period the following number were trained in the several professional classifications:

Health Officers	22
Public Health Nurses	112
Sanitary Engineers	15
Sanitarians	26
Sanitary Officers	14
Laboratory Technicians	7

During the biennium there were added to the staffs of the local health departments as a result of increased State and local appropriations and the availability of Social Security funds, the following personnel:

Health Officers	17
Public Health Nurses	89
Sanitation Personnel	40
Clerk-Stenographers	32
Laboratory Technicians	4
Dental Weeks	479

An attempt has been made to improve the type of health service rendered in the local health units. Funds at our disposal have been used to add additional personnel in order that more adequate health service might be provided and the standard of the services be improved. Wherein the local people have been interested to the extent of being willing to make an appropriation toward financing a local service, we have cooperated. These developments have been made by inaugurating new health services on the county-unit plan or by the development of district health departments in those areas having low assessed valuations and sparsely settled communities. During the biennium three such new services were organized. Additional counties were added to existing services, creating two district health departments wherein the service had been on a county basis.

Through the cooperation of the Julius Rosenwald Fund, the services of a negro physician were made available during the biennium for conducting a public health educational program among the negro race in North Carolina. This physician has worked through the local health departments, cooperating with the local health officers. During the period January 1, 1936, to June 30, 1938, a total of 1,844 lectures to negro groups were given on school hygiene, general health, maternal and infant hygiene, health problems of the negro, tuberculosis control, syphilis control, and public health nursing. During this period, this physician visited 837 schools and gave 876 lectures in these schools, lecturing to 86,473 negro school children. He rendered services at 247 preschool clinics and inspected 21,701 children in the elementary schools and high schools. Wassermann tests in selected groups were taken on 8,127 persons. There were 5,215 children tuberculin tested. During the summer months institutes have been conducted by this physician, cooperating with the State Department of Public Instruction, in the summer schools for negro teachers. A total of 120 lectures were given in these institutes, the total attendance being 3,791. In addition, the attendance at lectures given to negro adults has totaled 43,729.

Pertinent data concerning local health departments is shown in Table No. 1-A and Table No. 1-B.

The amount of work performed during the biennium by the seventy-three local health departments in operation on June 30, 1938, is recorded in Table No. 2.

TABLE No. 1-A—DATA ON FULL-TIME COUNTY AND DISTRICT

County or District	1930 Popula- tion	Date of Organ- ization	Total Budget	
			Amount	Per Capita
Avery-Watauga-Yancey.....	41,454	1935	\$ 24,434.24	.589
Beaufort.....	35,026	1923	10,721.04	.306
Bertie.....	25,844	1934	11,780.00	.456
Bladen.....	22,389	1921	7,670.00	.343
Buncombe (exclusive of Asheville).....	47,744	1913	24,099.00	.505
Cabarrus.....	44,331	1919	14,493.68	.327
Columbus.....	37,720	1921	11,806.04	.313
Craven.....	30,665	1921	11,916.00	.389
Cumberland.....	45,219	1919	22,114.61	.489
Davidson.....	47,865	1917	11,594.00	.242
Duplin.....	35,103	1934	10,748.34	.306
Durham.....	67,196	1913	56,477.00	.840
Edgecombe.....	37,872	1919	14,304.00	.378
Forsyth-Stokes-Yadkin (exclusive of Winston-Salem).....	76,707	1913-31	50,854.00	.663
Franklin.....	29,456	1930	5,160.00	.175
Gaston.....	78,093	1928	16,667.76	.213
Granville.....	28,723	1919	11,571.03	.403
Guilford (exclusive of Greensboro and High Point).....	42,696	1911	17,818.80	.417
Halifax.....	53,246	1919	17,120.00	.322
Harnett.....	39,911	1936	12,000.00	.301
Haywood-Jackson-Swain.....				
Macon-Graham.....	76,873	1934-36	41,178.20	.535
Hertford.....	17,542	1936	11,120.00	.634
Lenoir.....	35,716	1917	10,416.00	.292
Mecklenburg (exclusive of Charlotte).....	45,296	1918	17,753.00	.392
Moore.....	28,215	1928	9,800.00	.347
Nash (exclusive of Rocky Mount).....	41,392	1915	8,076.19	.194
New Hanover.....	43,010	1913	42,912.76	.998
Northampton.....	27,161	1917	8,760.00	.323
Orange-Person.....	43,210	1935	33,694.44	.779
Pitt.....	54,466	1917	15,355.00	.282
Randolph.....	36,259	1927	12,236.19	.337
Richmond.....	34,016	1924	10,931.00	.321
Robeson.....	66,512	1912	16,888.14	.254
Rowan.....	56,665	1918	12,505.00	.221
Rutherford.....	40,432	1924	11,124.88	.275
Sampson.....	40,082	1913	12,760.71	.318
Surry.....	39,749	1919	10,439.87	.263
Vance.....	27,294	1920	11,218.16	.411
Wake.....	94,757	1918	33,360.35	.352
Wayne.....	53,013	1920	20,201.10	.381
Wilkes.....	36,162	1920	9,422.93	.260
Wilson.....	44,914	1916	13,296.00	.295
Totals.....	1,850,016		\$ 736,799.46	.398

COUNTIES WITH NURSE OR SANITARY OFFICE

Brunswick.....	15,818	1924	1,970.00	.125
Caldwell.....	28,016	1931	1,830.00	.065
Pamlico.....	9,299	1923	2,879.91	.310
Total.....	53,133		\$ 6,679.91	.126
GRAND TOTALS.....	1,903,149		\$ 743,479.37	.391

*—Non-medical health officer. †—Part-time health officer. ‡—Technician. b—Bacteriologist.

cl—Clinician. c—Clerk. cp—County Physician. d—Dentist. **—Discontinued Nov. 1, 1936. D—Director

HEALTH SERVICES—NORTH CAROLINA—FISCAL YEAR 1936-37

Sources of Funds and Amounts						Whole-Time Personnel					
Local Appropriation	Per Capita	State Allotment	Per Capita	Other Agencies	Per Capita	Health Officer	Other N.-Med Officer	Nurse	Insp.	Clerk-Other	Den. Wks.
4,594.24	.111	\$ 4,320.00	.104	\$ 15,520.00	.374	2	-----	3	2	3	40
6,057.04	.173	1,404.00	.040	3,260.00	.093	1	-----	2	1	1	20
6,146.00	.238	1,134.00	.044	4,500.00	.174	1	-----	2	1	1	20
5,000.00	.223	450.00	.020	2,220.00	.099	1	-----	1	1	1	20
20,775.00	.435	1,404.00	.029	1,920.00	.040	1	-----	3	2	epcl 3	36
9,789.68	.221	1,404.00	.032	3,300.00	.074	1	-----	2	2	1	32
6,064.04	.161	900.00	.024	4,842.00	.128	1	-----	2	1	1	20
6,756.00	.220	1,560.00	.051	3,600.00	.117	1	-----	2	2	1	13
15,442.65	.342	1,404.00	.031	5,267.96	.116	1	-----	5	1	et 2	20
6,938.00	.145	1,296.00	.027	3,360.00	.070	1	-----	2	1	1	20
6,215.00	.177	1,080.00	.031	3,453.34	.098	1	-----	2	1	1	20
49,517.00	.736	1,560.00	.023	5,400.00	.080	1	* 1	11	6	ctd 6	-----
9,000.00	.238	1,404.00	.037	3,900.00	.103	1	-----	3	1	1	20
36,282.00	.473	3,672.00	.048	10,900.00	.142	1	-----	12	2	epc 5	32
3,900.00	.132	1,260.00	.043	-----	-----	1	-----	1	-----	1	-----
12,443.76	.159	1,404.00	.018	2,820.00	.036	1	-----	3	1	1	20
7,227.03	.252	1,404.00	.049	2,940.00	.102	1	-----	2	1	1	20
14,014.80	.328	1,404.00	.033	2,400.00	.056	1	-----	3	1	1	40
11,540.00	.217	1,404.00	.027	4,176.00	.078	1	-----	4	2	1	20
6,000.00	.150	1,500.00	.038	4,500.00	.113	1	-----	2	1	1	20
<hr/>											
9,678.20	.126	8,100.00	.105	23,400.00	.304	3	-----	6	4	te 6	66
5,000.00	.286	1,260.00	.072	4,860.00	.277	1	-----	2	1	1	13
7,260.00	.203	1,296.00	.036	1,860.00	.052	1	-----	2	1	1	-----
14,349.00	.317	1,404.00	.031	2,000.00	.044	1	-----	3	1	epbcd4	-----
5,000.00	.177	900.00	.032	3,900.00	.138	1	-----	2	1	1	-----
6,996.19	.169	1,080.00	.026	-----	-----	†	-----	1	1	1	20
39,648.76	.922	1,404.00	.033	1,860.00	.043	1	-----	5	8	etcp 3	20
4,896.00	.180	864.00	.032	3,000.00	.110	1	-----	2	1	1	-----
9,474.44	.219	4,400.00	.102	19,820.00	.459	2	-----	4	2	3	46
11,323.50	.208	1,404.00	.026	2,627.50	.148	1	-----	3	2	1	26
6,092.19	.168	1,134.00	.031	5,010.00	.138	1	-----	2	1	1	30
7,715.00	.227	1,296.00	.038	1,920.00	.056	1	-----	2	1	1	-----
9,424.14	.142	1,404.00	.021	6,060.00	.091	1	-----	4	1	1	20
9,505.00	.168	1,350.00	.024	1,650.00	.029	1	-----	2	1	1	23
5,528.88	.137	1,296.00	.032	4,300.00	.106	1	-----	2	1	1	22
5,584.71	.139	1,296.00	.032	5,880.00	.147	1	-----	2	1	epc 2	20
5,093.87	.128	1,296.00	.032	4,050.00	.102	1	-----	2	1	1	-----
5,206.16	.191	1,072.00	.036	5,040.00	.185	1	-----	2	1	1	20
25,956.35	.274	1,404.00	.015	6,000.00	.063	1	-----	5	4	dct 3	-----
15,167.10	.286	1,404.00	.027	3,630.00	.068	1	-----	4	2	1	20
4,732.93	.131	996.00	.027	3,694.00	.102	1	-----	2	1	1	-----
9,660.00	.215	1,296.00	.029	2,340.00	.052	1	-----	3	1	1	-----
<hr/>											
\$ 466,994.66	.252	\$ 68,624.00	.037	\$201,180.80	.109	45	1	129	68	71	779

R AS DIRECTOR OF LOCAL HEALTH PROGRAM

\$ 1,820.00	.115	\$ 150.00	.009	-----	-----	-----	-----	1	-----	-----	-----
1,530.00	.055	300.00	.011	-----	-----	-----	-----	-----	1	-----	-----
2,519.91	.271	360.00	.039	-----	-----	-----	-----	1	-----	D 1	-----
<hr/>											
\$ 5,869.91	.110	\$ 810.00	.015	-----	-----	-----	-----	2	1	1	-----
<hr/>											
\$ 472,864.57	.248	\$ 69,434.00	.036	\$201,180.80	.106	45	1	131	69	72	779

TABLE No. 1-B—DATA ON FULL-TIME COUNTY AND DISTRICT

County or District	1930 Popula- tion	Date of Organ- ization	Total Budget	
			Amount	Per Capita
Anson.....	29,349	1938	\$ 12,540.00	.427
Avery-Watauga-Yancey.....	41,454	1935	24,371.74	.588
Beaufort.....	35,026	1923	10,840.00	.309
Bertie-Chowan.....	37,126	1934-37	15,765.50	.425
Bladen.....	22,389	1921	10,632.40	.475
Buncombe (exclusive of Asheville).....	47,744	1913	22,579.00	.473
Burke-Caldwell.....	57,426	1937	17,000.00	.296
Cabarrus.....	44,331	1919	15,035.88	.339
Cherokee-Clay-Graham.....	27,426	1937	18,855.22	.687
Columbus.....	37,720	1921	11,867.62	.315
Craven.....	30,665	1921	12,659.20	.413
Cumberland.....	45,219	1919	19,913.71	.440
Dare-Hyde-Tyrrell & Washington.....	30,519	1937	25,427.50	.833
Davidson.....	47,865	1917	11,685.00	.244
Duplin.....	35,103	1934	10,820.00	.308
Durham.....	67,196	1913	60,482.00	.900
Edgecombe-Greene.....	56,528	1919-37	23,122.13	.409
Forsyth-Stokes-Yadkin (exclusive of Winston-Salem).....	76,707	1913-31	51,836.28	.676
Franklin.....	29,456	1930	5,160.00	.175
Gaston.....	78,093	1928	19,656.33	.252
Granville.....	28,723	1919	11,666.00	.406
Guilford (exclusive of Greensboro and High Point).....	42,696	1911	17,210.00	.403
Halifax.....	53,246	1919	17,680.00	.332
Harnett.....	39,911	1936	12,856.24	.322
Haywood-Jackson-Swain-Macon-Transylvania.....	80,621	1934-6-7	44,099.00	.547
Hertford.....	17,542	1936	11,838.78	.675
Johnston.....	57,621	1937	12,620.00	.219
Lenoir.....	35,716	1917	12,015.58	.336
Martin.....	23,400	1938	12,000.00	.513
Mecklenburg (exclusive of Charlotte).....	45,296	1918	21,664.00	.478
Moore.....	28,215	1928	13,068.00	.463
Nash (exclusive of Rocky Mount).....	41,392	1915	12,670.07	.306
New Hanover.....	43,010	1913	46,945.86	1.091
Northampton.....	27,161	1917	10,763.96	.396
Orange-Person-Chatham.....	67,387	1935-37	43,850.24	.651
Pitt.....	54,466	1917	15,034.00	.276
Randolph.....	36,259	1927	12,237.47	.338
Richmond.....	34,016	1924	10,538.00	.310
Robeson.....	66,512	1912	18,122.98	.272
Rowan.....	56,665	1918	13,420.00	.237
Rutherford.....	40,452	1924	11,981.82	.296
Sampson.....	40,082	1913	13,069.44	.326
Stanly.....	30,216	1937	12,180.00	.403
Surry.....	39,749	1919	10,981.37	.276
Vance.....	27,294	1920	11,412.50	.418
Wake.....	94,757	1918	36,762.82	.388
Wayne.....	53,013	1920	17,170.63	.324
Wilkes.....	36,162	1920	9,422.00	.261
Wilson.....	44,944	1916	14,195.42	.316
Totals.....	2,163,836		\$ 907,725.69	.419

COUNTIES WITH NURSE AS DIRE

Brunswick.....	15,818	1924	\$ 1,917.00	.121
GRAND TOTALS.....	2,179,654		\$ 909,642.69	.417

*—Non-medical health officer. t—Technician. b—Bacteriologist. c—Clerk. cp—County Physician. d—Dentist.

HEALTH SERVICES—NORTH CAROLINA—FISCAL YEAR 1937-38

Sources of Funds and Amounts						Whole-Time Personnel					
Local Appropriation	Per Capita	State Allotment	Per Capita	Other Agencies	Per Capita	Health Officer	Other N.-Med Officer	Nurse	Insp.	Clerk-Other	Den. Wks.
\$ 6,620.00	.226	\$ 1,440.00	.049	\$ 4,480.00	.153	1	-----	2	1	1	20
4,531.74	.109	4,320.00	.104	15,520.00	.374	2	-----	3	2	3	40
6,466.00	.185	1,440.00	.041	2,934.00	.084	1	-----	2	1	1	20
6,770.50	.182	2,892.00	.078	6,103.00	.165	1	-----	3	1	2	27
5,264.40	.235	1,152.00	.051	4,216.00	.188	1	-----	2	1	1	20
19,411.00	.407	1,440.00	.030	1,728.00	.036	1	-----	3	2	1	36
8,500.00	.148	2,500.00	.044	6,000.00	.104	1	-----	2	2	2	30
10,625.88	.240	1,440.00	.032	2,970.00	.067	1	-----	2	2	1	32
4,891.06	.178	3,000.00	.109	10,964.16	.400	1	-----	3	2	3	26
6,057.62	.160	1,152.00	.031	4,658.00	.123	1	-----	2	1	1	20
7,979.20	.260	1,440.00	.047	3,240.00	.106	1	-----	2	2	1	13
14,117.71	.325	1,440.00	.032	3,756.00	.083	1	-----	4	1	ct 2	25
5,787.50	.190	5,732.00	.188	13,908.00	.456	2	-----	4	2	4	34
7,341.00	.153	1,320.00	.028	3,024.00	.063	1	-----	2	1	1	20
6,266.00	.178	1,152.00	.033	3,402.00	.097	1	-----	2	1	1	20
54,062.00	.804	1,440.00	.021	4,980.00	.074	1	* 1	11	6	cdt 7	-----
13,372.13	.236	2,730.00	.048	7,020.00	.124	1	-----	4	2	2	33
36,948.28	.482	3,708.00	.048	11,180.00	.145	1	-----	12	2	cpct 6	26
3,900.00	.132	1,260.00	.043	-----	-----	1	-----	1	-----	1	-----
15,678.33	.201	1,440.00	.018	2,538.00	.032	1	-----	3	1	1	20
7,580.00	.264	1,440.00	.050	2,646.00	.092	1	-----	2	1	1	20
13,820.00	.324	1,440.00	.034	1,950.00	.046	1	-----	3	1	1	40
12,181.00	.229	1,440.00	.027	4,059.00	.076	1	-----	4	2	1	15
7,366.24	.184	1,440.00	.036	4,050.00	.101	1	-----	2	1	1	20
11,054.00	.137	8,100.00	.100	24,945.00	.309	3	-----	7	4	ct 6	56
5,904.78	.337	1,152.00	.066	4,782.00	.273	1	-----	2	1	1	13
6,500.00	.113	1,440.00	.025	4,680.00	.081	1	-----	2	1	1	20
8,256.58	.231	1,320.00	.037	2,439.00	.068	1	-----	3	1	1	-----
6,500.00	.278	1,440.00	.062	4,060.00	.174	1	-----	2	1	d 1	20
18,424.00	.407	1,440.00	.032	1,800.00	.040	1	-----	3	1	ep 2	-----
6,806.00	.241	1,152.00	.041	5,110.00	.181	1	-----	4	1	1	-----
7,990.07	.193	1,440.00	.035	3,240.00	.078	1	-----	2	1	1	20
43,831.86	1.019	1,440.00	.033	1,674.00	.039	1	-----	5	9	ctcp 3	20
6,491.96	.239	1,152.00	.042	3,120.00	.115	1	-----	2	1	1	-----
13,325.24	.198	5,480.00	.081	25,045.00	.372	2	-----	5	3	4	69
11,338.00	.208	1,440.00	.026	2,256.00	.041	1	-----	3	2	1	26
6,576.47	.181	1,152.00	.032	4,509.00	.124	1	-----	2	1	1	30
7,490.00	.220	1,320.00	.039	1,728.00	.051	1	-----	2	1	1	-----
10,928.98	.164	1,440.00	.022	5,754.00	.086	1	-----	4	1	1	20
10,495.00	.185	1,440.00	.025	1,485.00	.026	1	-----	2	1	1	34
6,791.82	.168	1,320.00	.033	3,870.00	.096	1	-----	2	1	1	32
6,157.44	.154	1,320.00	.033	5,592.00	.140	1	-----	2	1	1	20
7,500.00	.248	1,440.00	.048	3,240.00	.107	1	-----	2	1	1	20
5,936.37	.149	1,320.00	.033	3,725.00	.094	1	-----	2	1	1	-----
5,724.50	.210	1,152.00	.042	4,536.00	.166	1	-----	2	1	1	20
29,922.82	.316	1,440.00	.015	5,400.00	.057	1	-----	5	4	edt 3	-----
12,790.63	.241	1,440.00	.027	2,940.00	.055	1	-----	3	2	1	20
4,945.00	.137	1,152.00	.032	3,325.00	.092	1	-----	2	1	1	-----
10,619.42	.236	1,320.00	.029	2,256.00	.050	1	-----	3	1	1	-----
\$ 558,438.53	.258	\$ 92,150.00	.043	\$256,837.16	.119	54	1	153	81	84	997

CTOR OF LOCAL HEALTH PROGRAM

\$ 1,767.00	.112	\$ 150.00	.009	-----	-----	-----	1	-----	-----	-----	-----
\$ 560,105.53	.257	\$ 92,600.00	.042	\$256,837.16	.118	54	1	154	81	84	997

**TABLE No. 2—COMPILATION OF FULL-TIME LOCAL HEALTH
DEPARTMENT ACTIVITIES**

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
A. COMMUNICABLE DISEASE CONTROL:				
1. Admissions to service.....	64,901	22,752	310	87,963
2. Consultations with physicians.....	4,224	1,274	12	5,510
Field Visits:				
3. Diphtheria.....	7,187	1,077	21	8,285
4. Typhoid fever and paratyphoid fever.....	1,809	1,190	31	3,030
5. Scarlet fever.....	4,881	214	1	5,096
6. Smallpox.....	142	104	-----	246
7. Measles.....	38,628	7,149	182	45,959
8. Whooping cough.....	18,218	2,155	10	20,383
9. Other.....	15,680	13,311	75	29,066
Admissions to hospitals:				
10. Diphtheria.....	195	23	2	220
11. Typhoid fever and paratyphoid fever.....	81	42	-----	123
12. Scarlet fever.....	21	2	-----	23
13. Smallpox.....	2	-----	-----	2
14. Other.....	125	72	-----	197
Immunizations (persons immunized):				
15. Smallpox.....	107,904	59,991	1,622	169,157
16. Diphtheria—under 1 year.....	8,575	3,290	106	11,971
17. Diphtheria—1 year through 4 years.....	24,416	10,784	353	35,553
18. Diphtheria—5 years and over.....	27,409	9,321	211	36,941
19. Typhoid fever.....	228,380	86,848	1,643	316,871
20. Other.....	5,699	1,282	-----	6,981
21. Public lectures and talks.....	441	134	-----	575
22. Attendance.....	22,940	5,944	-----	28,884
B. VENEREAL DISEASE CONTROL:				
1. Admissions to medical service.....	16,023	61,648	375	78,046
2. Cases transferred to private physicians.....	1,050	2,843	5	3,898
3. Clinic visits.....	120,030	399,969	473	520,472
4. Field visits.....	4,578	23,054	70	27,702
5. Other service.....	3,981	11,984	15	15,980
6. Public lectures and talks.....	398	184	2	584
7. Attendance.....	33,527	25,208	200	58,935
C. TUBERCULOSIS CONTROL:				
1. Individuals admitted to medical service.....	16,730	7,627	85	24,442
2. Individuals admitted to nursing service.....	7,198	5,419	67	12,684
3. Physical examinations in clinics.....	23,908	21,449	82	45,439
4. X-ray examinations.....	16,533	9,678	368	26,579
5. Clinic visits.....	20,617	9,896	46	30,559
6. Visits to private physicians.....	969	555	3	1,527
7. Field nursing visits.....	24,942	21,123	173	46,238
8. Office nursing visits.....	3,279	870	9	4,158
9. Admissions to sanatoria.....	939	588	-----	1,527
10. Other service.....	13,196	4,487	1	17,684
11. Public lectures and talks.....	210	641	4	855
12. Attendance.....	19,892	9,794	-----	29,686

**TABLE No. 2—COMPILATION OF FULL-TIME LOCAL HEALTH
DEPARTMENT ACTIVITIES—Continued**

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
D. MATERNITY SERVICE:				
1. Cases admitted to antepartum medical service.....	3,048	11,231	279	14,558
2. Cases admitted to antepartum nursing service.....	7,396	12,148	290	19,834
3. Visits by antepartum cases to medical conferences...	5,514	26,557	406	32,477
4. Visits by antepartum cases to private physicians....	1,772	1,962	36	3,770
5. Field nursing visits to antepartum cases.....	19,379	26,537	335	46,251
6. Office nursing visits by antepartum cases.....	2,853	8,659	154	11,666
7. Cases attended by nurses for delivery service.....	121	352	-----	473
8. Cases given postpartum medical examination.....	571	1,593	19	2,183
9. Cases given postpartum exm. by private physicians	280	168	1	449
10. Cases admitted to postpartum nursing service.....	5,733	7,449	128	13,310
11. Nursing visits to postpartum cases.....	18,198	19,675	175	38,048
12. Other service.....	599	1,123	8	1,730
13. Midwives registered for formal instruction.....	131	764	8	903
14. Midwife meetings.....	250	927	-----	1,177
15. Attendance at meetings.....	905	4,406	12	5,323
16. Visits for midwife supervision.....	1,730	7,875	128	9,733
17. Other service.....	158	1,301	92	1,551
18. Public lectures and talks.....	198	265	-----	463
19. Attendance.....	2,813	3,628	20	6,461
20. Enrollment in maternity classes.....	510	2,088	2	2,600
21. Attendance.....	642	2,387	2	3,031
E. INFANT AND PRESCHOOL HYGIENE:				
Infants:				
1. Individuals admitted to medical service.....	6,030	6,477	159	12,666
2. Individuals admitted to nursing service.....	14,881	12,857	230	27,968
3. Visits to medical conferences.....	15,962	15,659	81	31,702
4. Visits to private physicians.....	1,162	814	11	1,987
5. Field nursing visits.....	49,708	35,441	303	85,452
6. Office nursing visits.....	2,902	3,643	95	6,640
7. Other service.....	2,084	2,184	44	4,312
Preschool:				
8. Individuals admitted to medical service.....	25,887	7,445	210	33,542
9. Individuals admitted to nursing service.....	18,878	6,895	73	25,846
10. Visits to medical conferences.....	26,158	10,850	222	37,230
11. Visits to private physicians.....	823	226	4	1,053
12. Field nursing visits.....	27,711	10,495	136	38,342
13. Office nursing visits.....	3,854	2,935	58	6,847
14. Inspections by dentists or dental hygienists.....	6,873	562	-----	7,435
15. Prophylaxis by dentists or dental hygienists.....	1,319	89	-----	1,408
16. Other service.....	9,138	2,063	431	11,632
17. Public lectures and talks.....	269	734	-----	1,003
18. Attendance.....	6,296	5,286	-----	11,582
19. Enrollment in infant and preschool classes.....	2,454	697	10	3,161
20. Attendance.....	1,817	1,454	-----	3,271

**TABLE No. 2—COMPILATION OF FULL-TIME LOCAL HEALTH
DEPARTMENT ACTIVITIES—Continued**

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
F. SCHOOL HYGIENE:				
1. Inspections by physicians or nurses.....	736,983	198,700	2,145	937,828
2. Examinations by physicians.....	133,841	34,598	2,967	171,406
3. Examinations by physicians with parents present.....	10,164	2,663	304	13,131
4. Individuals admitted to nursing service.....	31,131	9,785	11	40,927
5. Field nursing visits.....	54,183	16,749	253	71,185
6. Office nursing visits.....	10,760	2,217	111	13,088
7. Inspections by dentists or dental hygienists.....	200,975	41,306	1,282	243,563
8. Prophylaxis by dentists or dental hygienists.....	166,410	29,383	443	196,236
9. Other service.....	92,677	44,393	1,612	138,682
10. Public lectures and talks.....	1,642	1,399	4	3,045
11. Attendance.....	119,150	48,383	15	167,548
12. Classroom health talks.....	12,474	6,335	43	18,852
13. Attendance.....	354,396	184,692	1,838	540,926
G. ADULT HYGIENE:				
Medical Examinations:				
1. Milk-handlers.....				5,819
2. Other food-handlers.....				30,631
3. Midwives.....				1,397
4. Teachers.....				8,639
5. Other.....	8,224	6,741		14,965
H. MORBIDITY SERVICE:				
1. Admissions to medical service.....	26,280	26,784	128	53,192
2. Admissions to nursing service.....	10,321	3,440	43	13,804
3. Clinic visits.....	32,193	51,193	43	83,429
4. Field medical visits.....	6,257	2,607	48	8,912
5. Field nursing visits.....	35,692	16,681	23	52,396
6. Office nursing visits.....	8,787	14,389	66	23,242
7. Admissions to hospitals.....	5,800	4,015	80	9,895
8. Total patient-days of hospital service.....	62,242	47,856	3,826	113,924
9. Individuals admitted to dental service.....	17,551	2,060	53	19,664
10. Refractions.....	2,343	121	17	2,481
11. Tonsil and adenoid operations.....	4,321	671	8	5,000
12. Other service.....	6,492	248	46	6,786
I. CRIPPLED CHILDREN SERVICE:				
1. Individuals admitted to medical service in clinics.....	6,663	1,893	27	8,583
2. Individuals admitted to nursing service.....	1,050	317	14	1,381
3. Visits to clinics.....	5,543	1,590	58	7,191
4. Nursing visits.....	2,516	947	37	3,500
5. Other service.....	432	131	1	564
6. Public lectures and talks.....	92	21		113
7. Attendance.....	409	92		501

**TABLE No. 2—COMPILATION OF FULL-TIME LOCAL HEALTH
DEPARTMENT ACTIVITIES—Continued**

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
J. GENERAL SANITATION:				
1. Approved individual water supplies installed.....				4,257
2. New privies installed.....				45,879
3. New septic tanks installed.....				4,444
Field visits:				
4. Private premises.....				247,750
5. Camp sites.....				2,852
6. Swimming pools.....				2,161
7. Barber shops and beauty parlors.....	287	108		395
8. Schools.....				10,728
9. Public water supplies.....				5,899
10. Sewerage plants.....				9,414
11. Other.....				56,955
12. Buildings mosquito proofed.....	664	165		769
13. Minor drainage—linear feet completed.....				1,070,960
14. Anopheles breeding places eliminated.....				2,493
15. Anopheles breeding places controlled.....				4,417
16. Other service.....	6,742	1,562	116	8,420
17. Public lectures and talks.....	239	364	2	605
18. Attendance.....	8,691	4,898	65	13,654
K. PROTECTION OF FOOD AND MILK:				
1. Food-handling establishments registered for supv.....	3,577	556	3	4,136
2. Field visits to food-handling establishments.....				579,211
3. Dairy farms registered for supervision.....				1,360
4. Field visits to dairy farms.....				29,537
5. Milk plants registered for supervision.....				95
6. Field visits to milk plants.....				4,695
7. Cows tuberculin tested.....				42,889
8. Animals slaughtered under inspection.....				168,514
9. Carcasses condemned in whole or in part.....				71,557
10. Other service.....				92,664
11. Public lectures and talks.....	76	139	7	222
12. Attendance.....				1,760
L. LABORATORY:				
Specimens Examined:				
1. Water—bacteriological.....				20,281
2. Water—chemical.....				6,283
3. Milk or milk products.....				26,028
4. Other food.....				218
5. Typhoid: blood cultures.....				1,210
6. Typhoid: Widal.....				1,002
7. Typhoid: stool cultures.....	1,706	1,134	154	2,994
8. Typhoid: urine cultures.....				2,163
9. Diphtheria cultures.....				20,099
10. Syphilis.....				187,470
11. Undulant fever (human).....				259
12. Bangs disease (animal).....				43,459
13. Typhus fever.....	297	5		302
14. Tularemia.....				8
15. Malaria.....				18,881
16. Gonorrhea.....				14,861
17. Tuberculosis.....				6,329
18. Feces for parasites.....				16,311
19. Urinalysis.....				47,557
20. Rabies.....				239
21. Other service.....				10,079

**TABLE No. 2—COMPILATION OF FULL-TIME LOCAL HEALTH
DEPARTMENT ACTIVITIES—Continued****July 1, 1936 to June 30, 1938**

	White	Colored	Indian	Total
M. REPORTABLE DISEASES:				
Anthrax (20).....				
Chickenpox (44a).....	6,775	1,557	37	8,369
Diphtheria (10).....	2,552	378	12	2,942
Dysentery (13).....	24	15		39
Gonorrhea (35).....	2,442	2,649	26	5,117
Hookworm (40).....	331	87	25	443
Influenza (11).....	893	243		1,136
Malaria (38).....	804	362	4	1,170
Measles (7).....	38,038	7,560	157	45,755
Meningococcus meningitis (18).....	111	99	1	211
Ophthalmia neonatorum (35).....	9	15		24
Pellagra (62).....	713	207	21	941
Pneumonia (107-109).....	480	200		680
Poliomyelitis (16).....	84	20		104
Puerperal septiceemia (145).....	3	2		5
Rabies in man (21).....	3	2		5
Rabies in animal.....				121
Scarlet fever (8).....	2,594	68	1	2,663
Smallpox (6).....	15	17		32
Streptococci sore throat (115a).....	307	40		347
Syphilis (34).....	4,607	23,977	127	28,711
Trachoma (88).....	5	5	1	11
Tuberculosis (23-32).....	2,591	1,864	24	4,479
Tularemia (44c).....	14	10		24
Typhoid fever (1).....	485	282	4	771
Typhus fever (3).....	60	12		72
Undulant fever (5).....	242	9		251
Whooping cough (9).....	13,321	2,518	56	15,895

SUPPLEMENTAL REPORT**July 1, 1936 to June 30, 1938**

	White	Colored	Indian	Total
N. POPULATION:				
1. Under one year.....	42,142	17,943	445	60,530
2. Under five years.....	216,892	93,809	2,261	312,962
3. Five to nine inclusive.....	230,988	106,544	2,743	340,275
4. Ten to fourteen inclusive.....	204,163	96,293	3,277	303,733
5. Fifteen and over.....	1,123,496	511,733	7,853	1,643,082
6. Number of practicing physicians.....	2,522	141		2,663
7. Number of practicing dentists.....	720	80		800
8. Number of practicing midwives.....	413	1,700		2,113

SUPPLEMENTAL REPORT—Continued

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
O. VITAL STATISTICS:				
1. Live births.....	63,372	3,064	1,356	67,792
2. Still births.....	1,571	1,594	38	3,203
3. Deaths under one year.....	2,553	2,002	43	4,598
4. Deaths under one month.....	1,911	1,374	36	3,321
5. Puerperal deaths.....	164	156	1	321
6. Total deaths.....	25,940	16,841	281	43,062
Communicable disease deaths:				
7. Typhoid and paratyphoid fever.....	40	33	-----	73
8. Measles.....	29	22	-----	51
9. Scarlet fever.....	19	-----	-----	19
10. Whooping cough.....	67	18	1	86
11. Diphtheria.....	134	37	6	177
12. Tuberculosis, all forms.....	967	1,466	6	2,439
13. Diarrhea and enteritis under two years.....	419	275	9	703
14. Number vital statistics visits.....	3,319	2,352	14	5,685
P. COMMUNICABLE DISEASE CONTROL:				
1. Schick negative (under age 10).....	38,460	4,406	700	43,566
2. Schick positive (under age 10).....	10,116	727	64	10,907
3. Tuberculin negative (under age 20).....	78,979	26,635	1,791	107,405
4. Tuberculin positive (under age 20).....	17,063	8,008	2,112	27,183
5. Tuberculosis patients in Burr cottages.....	23	62	-----	85
6. Attendance preventoria and open air classes.....	247	14	-----	261
7. Specimens collected for darkfield negative.....	194	477	-----	671
8. Specimens collected for darkfield positive.....	66	176	-----	242
9. Syphilis treatments.....	106,479	364,598	883	471,960
10. Gonorrhea treatments.....	21,634	30,510	209	52,353
11. Chaneroid treatments.....	8,408	19,253	-----	27,661
Q. INFANT, PRESCHOOL, AND SCHOOL HYGIENE:				
1. Children referred for medical care.....	115,800	25,758	1,312	142,870
2. Children with defects corrected.....	34,763	3,836	240	38,839
a. Teeth.....	82,706	14,370	321	97,397
b. Tonsils.....	10,137	1,208	86	11,431
c. Eyes.....	5,128	549	24	5,701
R. GENERAL SANITATION:				
1. Sewer connections new.....	5,534	970	-----	6,504
2. Sewer connections restored.....	1,102	870	-----	1,972
3. Complaints investigated.....	19,474	7,843	8	27,325
4. New water connections.....	-----	-----	-----	Incomplete
S. GENERAL PUBLIC HEALTH INSTRUCTION:				
1. Newspaper articles published.....	6,622	286	75	6,983
2. Circular letters sent out.....	139,986	36,370	3,584	179,940
3. Bulletins, posters distributed.....	358,862	92,281	3,704	454,847
4. Health exhibits, special demonstrations.....	1,467	785	223	2,475

SUPPLEMENTAL REPORT—Continued

July 1, 1936 to June 30, 1938

	Health Officer	Nurse	Sanitarian	Total
T. ADMINISTRATION:				
1. Staff conferences.....	3,712	2,919	1,607	8,238
2. Meetings with official bodies.....	2,309	906	835	4,050
3. Court proceedings instituted.....	136	18	449	603
4. Meetings with non-official bodies.....	2,146	2,004	1,413	5,563
5. Conferences with officials.....	16,686	12,979	12,030	41,695
6. Conferences with physicians.....	11,087	15,613	1,802	28,502
7. Other conferences.....	44,536	86,011	55,605	186,152
8. Visits to schools.....	10,689	43,893	7,725	62,307
9. Hours in office.....	102,796	185,459	60,712	348,967
10. Hours in field.....	106,732	474,497	218,006	799,235
11. Miles traveled.....	1,046,535	2,476,548	1,553,741	5,076,824
12. Not-home visits.....	749	15,707	5,784	22,240
13. Days off duty.....	879	3,825	1,326	6,030

MONTHLY REPORT OF COUNTY PHYSICIAN

July 1, 1936 to June 30, 1938

	White	Colored	Indian	Total
1. No. of treatments or examinations given at home.....	4,278	2,134	11	6,423
2. No. of home visits.....	7,047	4,088	3	11,138
3. No. of treatments or examinations given in office.....	39,313	39,870	461	79,644
4. Total visits under (3) to office.....	51,004	59,101	512	110,617
5. No. of visits to county jail.....	8,776	1,913	216	10,905
6. No. of treatments or examinations given in county jail.....	12,789	12,383	184	25,356
7. No. of visits to county home.....	7,392	1,466	-----	8,858
8. No. of treatments or examinations given in county home.....	24,736	13,541	325	38,602
9. No. of visits to County T. B. Hospital.....	1,614	205	-----	1,819
10. No. of treatments or examinations given in County T. B. Hospital.....	4,959	1,217	-----	6,176
11. No. of completed anti-rabic treatments.....	423	19	9	451
12. No. of treatments, hookworm.....	817	343	26	1,186
13. No. of examinations, prisoners.....	6,198	5,522	174	11,894
14. No. of examinations, teachers.....	5,330	2,038	5	7,373
15. No. of examinations, child for industry.....	6,869	1,009	-----	7,878
16. No. of examinations by court order.....	492	188	2	682
17. No. of examinations for admission to institution.....	1,505	536	66	2,107
18. No. of examinations for lunacy.....	1,099	675	16	1,790
19. No. of examinations, postmortem.....	111	120	1	232

DIVISION OF INDUSTRIAL HYGIENE

This Division during the past biennium, the first full two-year period of its existence, has been concerned almost exclusively with problems involving siliceous dusts, which constitute the most extensive occupational disease hazards in North Carolina. Silica, the primary causative factor responsible for the development of various forms of lung impairment, is widely distributed in nature, being present in the earth's crust to the extent of almost 60%. In the category of siliceous dust industries are the numerous mining operations in the western and central areas of the State, the quarrying and screening of granite, the cutting and shaping of building and monumental stone, the weaving and fabrication of asbestos textiles, the preparation of sand molds and the cleaning and machining of iron castings, sand blasting, the manufacture of brick and tile products, etc. Wherever sand or other minerals containing silica are employed or processed siliceous dusts very probably are generated in sufficient quantity to produce an occupational disease hazard. To a less extent the processing of some agricultural products may be accompanied by the creation of a similar hazard; particularly is this a possibility in the scutching and carding of low grade cotton, the cleaning and shelling of peanuts, and the handling of tobacco lugs. In each of the latter instances the hazard would arise from the dissemination of fine sand and earth into the atmosphere of a closed room.

The major accomplishments of the Division during the past two years have been an evaluation of the extent of the occupational disease hazards involved in the founding of grey iron, the mining and milling of pyrophyllite (a talc-like mineral), and the quarrying and screening of granite. These investigations required the collection of much medical and engineering data, which were subjected to extensive statistical analyses in the course of their correlation and study to evolve practical conclusions that might be utilized by the industries concerned. These investigations were not prosecuted singly to completion, but were made concurrently with each other and with other minor studies and routine tasks.

The foundry study, initiated during the first quarter of the biennium, extended through the first half of the second year. In order to rule out practices, location, and climate as predisposing causes of such occupational pathology as might be discovered, the plants selected for study were widely distributed. The 24 foundries in which data were collected constitute more than half of the total number of such plants in the State. Survey data obtained during the preceding biennium, covering more than 90% of them, indicated that the operating practices in the foundries selected for study were representative of the entire industry.

The foundry investigation involved the clinical and roentgenological examination of 680 workers, of whom 134 were pre-employment cases. None of the latter exhibited evidence of pathology that might

be attributable to exposure to siliceous dust. Of the 546 employees with more than one year's experience in the industry, 1.5% were found to have silicosis in Stage 1 of the disease and 8.2% to have pathology not sufficiently advanced to indicate silicosis but which did warrant a diagnosis as M. F. U. cases, i. e., "more pulmonary fibrosis than usual." Thus, 9.7% of the workers exhibited pulmonary pathology attributable to the inhalation of siliceous dust. The engineering studies involved a determination of the nature, particle size, and concentration of the atmospheric dust by occupation and department, and a study of two exhaust ventilation systems to determine their efficiency in the capture and safe disposal of such dust. The result of this work revealed (1) that foundry dust contains silica, (2) that a large percentage of the particles are of such size as to permit their penetration into the lungs, and (3) that the atmospheric dust varies in concentration from only slightly contaminated air to almost 400 million particles of dust per cubic foot of air. Such dust concentrations represent maximum and minimum conditions, average values being considerably less in most instances. As a result of the foundry investigation, it was possible to establish that the molding room workers should not be exposed to more than 12 million particles of dust per cubic foot of air and that 20 million particles should be the upper limit of air dustiness for casting shake-out and cleaning crews. The study revealed that only 6 foundries have attempted to control dust dissemination, and of the systems employed for this purpose only one is performing satisfactorily. The results obtained in this study were presented in a formal report which, aside from the evaluation of the health hazards involved, presents a picturization of the industry in the State with respect to plant size as regards number of workers employed, trade practices, mechanization, and duties involved by occupation.

During the first quarter of this biennium the filing of compensation claims by four disabled former employees of a pyrophyllite mining and milling company precipitated a study of this operation. An investigation was inaugurated shortly thereafter and continued intermittently throughout the biennium. The study was launched by the clinical and X-ray examination of 90 workers, some of whom were later re-examined to ascertain the activity of pulmonary lesions revealed by the initial clinic. New workers and the location of former employees who were examined on subsequent trips to the company ultimately brought to 100 the number of individuals examined. In order to establish the nature of the pulmonary pathology exhibited by the more seriously affected workers, sputum examinations for the tubercle bacillus were made for 14 persons by the Division medical technician. In addition, sputum from five individuals was submitted to Dr. D. T. Smith, of the Duke University Medical School, for inoculation into guinea pigs. Both sputum examinations and guinea pig inoculations for evidence of the tubercle bacillus yielded negative results. Slightly more than half (59%) of the pyrophyllite workers have been in the industry less than 2 years, none of whom exhibited evidence of pulmonary pathology attributable to dust. Among the 41 employees

whose exposure exceeded two years, there were 12 cases of pneumoconiosis and two diagnosed as M. F. U. Thus, 14 or 1-3 of the 41 older employees exhibited dust pathology. The high incidence of pulmonary infection for this group of workers indicates the existence of a serious occupational disease hazard. During the biennium two former pyrophyllite workers died, and autopsies were performed on both bodies. These autopsies were performed by the physicians of this Division and Dr. C. C. Carpenter, of the Wake Forest College School of Medicine. Histological studies on the lungs from both bodies were made by Dr. Carpenter. The engineering studies revealed that the mine and plant atmospheric dust contained silica, that the particles were minute enough to penetrate into the lungs, and that the concentration of atmospheric dust was quite high. In the mine drilling exposed the drill runners to approximately 500 million particles of dust per cubic foot of air, and in the mill dust concentrations in excess of 1 billion particles were revealed. The average atmospheric dust concentrations to which drillers and the baggers of the powdered mineral were exposed approximated $\frac{1}{2}$ billion particles per cubic foot of air. The dust exposure of other workers was not as high, but in most instances exceeded the permissible limits established by digest of medical and engineering data. This investigation established that the maximum permissible atmospheric dust concentration should not exceed 10 million particles per cubic foot of air in the mine nor 25 million particles in the mineral grinding plant.

The investigation of granite quarrying in the State with respect to occupational disease hazards began in the spring of 1937 and continued at intervals during the remainder of the biennium. There were 15 quarry operations involved, 9 in which both engineering and medical studies were made, 2 in which only medical work was performed, and 4 in which only dust counts were made. The investigation involved the examination of 614 workers, of whom 234 had spent less than 1 year in the industry. Among the 380 persons with longer exposure records, only 14 exhibited evidence of lung impairment attributable to the inhalation of granite dust. Thus, only 3.7% of the older workers were found affected. Only one case of silicosis was discovered, this being Stage I, or simple, silicosis. The other pathological cases were all diagnosed as M. F. U. In order to evaluate the dust exposure by occupation there were 161 dust counts made on samples of atmospheric dust collected in various parts of the quarries and at the screening plants. In addition, samples of settled dust and quarry aggregates were collected for analysis at 8 operations. Particle size measurements of the atmospheric dust of quarries were not made during the biennium but are to be made at the first opportunity during the succeeding biennium. The quarry study is not considered as finished, despite the fact that considerable data have been collected. In answer to a demand for information with respect to the extent of the occupational disease hazards involved in quarry work, a tentative permissible maximum air dustiness was established at 25 million particles of dust per cubic foot of air. Such a threshold limit was

indicated after a statistical analysis of the data on hand had been made.

During the biennium a report was prepared for each of the three major investigations that have been discussed. The foundry report previously mentioned contains 60 pages, exclusive of those carrying tables and illustrations. The results of the pyrophyllite study are contained in a comprehensive report, which at the close of the biennium had not progressed beyond the first, or tentative, draft. This report will contain about the only data extant on the occupational disease hazards associated with the extraction and processing of this mineral; consequently, great care is being taken in the presentation of the results of the investigation. The results of the quarry study were presented in a mimeographed booklet of some 20 pages. The foundry report was distributed to North Carolina foundrymen, to Health Officers throughout the State, to other State Health Departments and interested agencies. The tentative draft of the pyrophyllite report has been submitted to the company involved. The granite report, while completed during the biennium, was not distributed until after its close.

In addition to the foundry, pyrophyllite, and quarry studies a variety of other investigations were made, some of which and their nature are revealed in the following tabulation:

	<i>Operations Involved</i>	<i>Dust Counts Made</i>
Brick Manufacture*	3	18
Talc Mining and Milling.....	1	32
Mica Milling*	1	16
Mica Milling	1	4
Mica Milling and Fabrication.....	1	11
Mica mining	1	5
Mica mining	1	6
Feldspar mining*	1	5
Cotton mill (carding room)*.....	1	6
School corridors	1	3
Highway construction*	1	3 (in-
		cluded in quarry study)

In the above tabulation only one investigation involved three operations; the data for the brick plant study was obtained at three similar plants. The other studies were made at different times and are separate investigations in so far as reporting is concerned. It may be of passing interest to note that the work in the corridors of a high school resulted in the replacement of worn-out dusty concrete with satisfactory floors.

Other investigations of interest: Two newspaper plants were visited to ascertain the amount of lead in the workroom atmospheres; there were 4 samples of atmospheric particulate matter obtained at one plant and 3 at the other. At the request of the Unemployment Compensation Commission tests were made for the presence of carbon monoxide in a

*Investigations involving compensation litigation or compensation insurance.

garage, part of which was in use as a file room. An illumination survey was made of the State Health Building to determine the adequacy of lighting facilities. A neighborhood dust nuisance created by the operation of a nearby granite cutting shed was investigated at the request of the local health officer.

Furthermore, the Division received requests for special work that could not be performed due to the press of other duties. One request involved a lead hazard in a printing office; another, the volatile solvent hazards in the dry cleaning industry; a third, spray painting; and a fourth, high temperature and humidity in a cotton mill.

The miscellaneous field medical tasks were varied. Undoubtedly, the most important work of this character performed during the biennium was a diagnostic clinic held in Charlotte to rate the disability of 70 asbestos textile plant workers whose claims for compensation had been in litigation for several years. This clinic was in the nature of a compromise means of settlement among physicians of the claimants, insurance carriers, and the Industrial Commission. Present were two doctors representing the litigants, two representing the insurance company, and three, constituting the Medical Advisory Committee, representing the Industrial Commission. Also in attendance was the Division's medical technician. Each litigant was given a thorough medical and fluoroscopic examination. Stereoscopic chest films were made of each person examined. Following this work, the group of physicians jointly studied and discussed the findings in each case in an attempt to arrive at a correct diagnosis and rating of disability.

Other special medical field work is presented in tabular form as follows:

No. Workers Employment	Examination	Alleged Disability	Alleged Cause of Disability
1 Cottonseed oil mill	Autopsy	Silicosis	Mineral dust from cotton seed
2 State Hwy. Comm.	Clinical & X-ray	Bronchial trouble	Metal fumes
1 Fertilizer plant	Clinical & X-ray	Respiratory	Nitrous oxide
2 Mica grinding	Clinical & X-ray	Silicosis	Mica dust
1 Furniture factory	Clinical & X-ray	Silicosis	Sandpaper dust
1 Granite cutting	Clinical & X-ray	Silicosis	Granite dust
1 Feldspar mining	Clinical & X-ray	Silicosis	Feldspar dust
1 Asbestos textile	Clinical & X-ray	Asbestosis	Asbestos dust

All the diagnostic work indicated in the above tabulation was performed in connection with compensation claims. In addition, an outbreak of dermatitis among bakery employees was investigated jointly with a practicing physician.

The preparation of reports consumed appreciable time. All of the investigations listed in the preceding tables were written up and submitted to the Industrial Commission and other interested agencies or persons. Individual plant reports were prepared for 4 stone cutting

plants and for 8 of the plants involved in the foundry study. Moreover, progress reports on the three major studies were prepared from time to time and sent to the Industrial Commission, to the Compensation Rating and Inspection Bureau, and to the State Department of Labor.

The Division personnel engaged in a variety of unrelated services involving occupational disease problems. Expert testimony was provided at 6 compensation hearings before the Industrial Commission and to attorneys for a litigant alleging disability resulting from the inhalation of chlorine gas. Upon request a study was made of the fugitive dyestuffs employed in coloring mercerized yarn to obtain information as to whether their contact with the skin may produce dermatoses. A report was prepared giving the results of this research. At the request of a hosiery mill official a boiling out preparation was examined to determine whether its presence in the atmosphere as a dust would be detrimental to the health of the workers. Assistance was given two practicing physicians in connection with the diagnoses of ailments suspected of being lead poisoning. Upon request the Division engineer assisted TVA personnel on two occasions in making studies of the atmospheric dust conditions in the quarries from which crushed stone is obtained for the construction of the Hiawassee Dam in Cherokee County.

A mortality study was made of the vital statistics records over a ten year period for six western counties in an attempt to determine the incidence of pulmonary tuberculosis and other respiratory diseases in the general population. This was a comparative study of three largely agricultural counties and three in which mining provided the principal source of income. This work was performed for the United States Public Health Service preliminary to its inauguration of a study to determine the extent of the siliceous dust hazard in the mica, kaolin, and feldspar industries. The Division personnel assisted in the execution of this study, lending aid primarily in the medical and roentgenological examination of some 1,100 workers. Some engineering assistance was provided, however, in surveying four plants, in collecting dust samples for particle size measurements and petrographic analysis, and in other ways.

The Division provided speakers for several National and State meetings and for local groups. The papers and talks delivered are listed as follows:

- Southern Medical Association, Richmond, paper.
- National Tuberculosis Association, Milwaukee, paper.
- American Public Health Association, New York, paper.
- Wake County Medical Association, Raleigh, paper.
- Mecklenburg County Medical Association, Charlotte, paper.
- Eighth Annual State-wide Safety Conference, Winston-Salem, paper.
- Ninth Annual State-wide Safety Conference, Asheville, 2 papers.
- Wake Forest Medical School, 2 lectures.
- Parent-Teacher Groups, 2 talks.

University of North Carolina Health and Social Science Classes, 8 talks.

Graduating Classes of Nurses at Rex Hospital, Raleigh, 2 talks.

Raleigh Engineers' Club, talk.

Health Officers' Meeting, talk.

Radio Station WPTF, 9 papers.

Total Presentations, 33.

The paper presented at the meeting of the American Public Health Association in New York, entitled "Development of an Industrial Hygiene Program in a State Health Department," was subsequently published in the May, 1938 issue of the Association's journal. A description of the Division's radiographic facilities was published in the June, 1938 issue of the *Journal of Industrial Medicine*. The article, "North Carolina's Mobile X-ray Laboratory," was profusely illustrated. In addition, miscellaneous papers were prepared for a variety of uses.

During the major portion of the first year of the biennium a 15-milliampere X-ray outfit for field examination of workers was transported about the State on a small trailer drawn by a passenger car. This arrangement proved to be very unsatisfactory in that quarters in which to set up the equipment had to be obtained at each location, resulting in much expenditure of time that could have been employed in medical work. In order to eliminate the time wasting features of the original set-up, a 20 foot trailer shell was purchased to provide mobile examination quarters. A local cabinet maker partitioned the interior of the trailer to form a small darkroom in the rear and a large examination room in front. Each compartment was then equipped in accordance with the requirements of the respective sections. The facilities of the trailer permit the development of films in the field; most of them, however, are processed in the Division offices in Raleigh. The large front compartment provided ample space for the portable X-ray outfit, two physicians, the X-ray technician, and even a worker or two awaiting examination.

During the first year of its use the portable radiographic equipment was employed in making approximately 2,000 chest X-ray films. While the roentgenograms produced were excellent for a machine of its capacity, it became increasingly apparent that an improvement in film quality was desirable. Especially was this need evident in films depicting the pathology of asbestos textile workers, the pulmonary lesions of which are not as pronounced as they are in the other siliceous dust diseases. Then, there were other considerations, to be revealed further along in the discussion, that justified more powerful equipment. During the first quarter of the second year, therefore, a 200-milliampere outfit, operating on a 220 volt circuit, was installed in the trailer. This equipment demonstrated its superiority over the original machine from the outset and has justified its purchase in all roentgenological work performed during the year of its use. It permits a more rapid technique, which alone justified its cost, as the motion of lung bases and heart are eliminated. It is also easier to duplicate results where radiographs are taken of a worker at six-month or

yearly intervals to follow progressive changes. Fluoroscopy can be performed much more satisfactorily than was possible with the smaller outfit. Moreover, greater consistency in results is achieved, and voltages, which vary with location and even hourly, are not so troublesome. And finally, clearer and sharper pictures are obtained consistently.

During the biennium 4,785 chest X-ray films have been made with the Division's radiographic equipment. In addition, its personnel assisted the U. S. Public Health Service workers in making 1,100 roentgenograms of workers in the mica, kaolin, and feldspar industries in the Spruce Pine area. Since the latter were interpreted jointly by the physicians of both the U. S. Public Health Service and the Division of Industrial Hygiene, the diagnoses based upon these films may be listed with the accomplishments of the Division. Accordingly, therefore, a total of 5,885 chest radiographs have been interpreted by Division personnel during the biennium.

The supplementary medical work included the examination of 81 specimens of sputum for the presence of the tubercle bacillus. This work was performed by the medical technician. The latter, however, has only a limited amount of time for such work since his duties involve the making of radiographs of the chest and their subsequent processing. On April 1, 1937, the collection of blood specimens, from all persons examined, for the Wassermann test was inaugurated. Between that time and the close of the biennium approximately 3,100 blood specimens have been submitted to the Laboratory of Hygiene for testing.

The radiographic and blood work necessitates an almost overwhelming amount of office routine. Whenever any serious defect or ailment comes to light during the course of the diagnostic work, the worker is informed of his condition by letter and advised to consult his physician. When syphilis is revealed, the worker is notified in like manner, and, in addition, the health officer of the county involved is given the name of the infected person.

The designing of exhibit cases and bulletin boards for the lower corridors of the State Board of Health Building in Raleigh, their equipment, and the supervision of construction by the local workshop of the National Youth Administration has been largely a function of this Division during the biennium. This work included one display case for each of seven divisions of the State Board of Health, two cases for another—the Division of Epidemiology, and a case for malarial control activities. There was also a case designed for the display of pellagra preventive foods and one for a first-aid-in-the-home exhibit. In all, twelve cases were designed. The miscellaneous work relative to the exhibits included an arrangement with State College students for the mounting of animals and wild fowl. In addition, the preparation and display of exhibit material consumed, all told, several weeks' time. Moreover, a display case was designed for the Industrial Commission, its construction by N. Y. A. workers supervised, and an exhibit installed. The case was displayed in the lobby of the convention hotel during the Ninth Annual State-wide

Safety Conference and is to become a permanent fixture of the Industrial Commission offices.

The other miscellaneous activities of the Division were varied. A measurement of the floor space occupied in both the State Health Building and the Laboratory of Hygiene was made at the direction of the State Health Officer to determine the total area of floor space in use. These data were obtained for submission to the Conference of State and Provincial Health Officers of America but served the Director of the Division of Laboratories in his endeavor to obtain funds for a new laboratory building. During some of the worst weather of the winter much of the industrial hygiene literature on hand in the form of reprints was abstracted and filed. The engineering equipment for dust sampling was calibrated several times and appreciable time spent in cleaning and otherwise preparing it for use. Personnel of the U. S. Public Health Service were assisted in obtaining samples of asbestos textile plant dust for analysis and study. The operators of the two mines were interviewed relative to the installation of safeguards. At both places methods for the control of dust have been installed, largely as a result of the activities of this Division. Several lengthy conferences were held with the Industrial Commission relative to the policy to pursue with respect to partially disabled workers. Particle size measurements with the high power of a microscope were made of approximately 2,000 particles of atmospheric dust.

The personnel of the Division at the beginning of the biennium consisted of a director, an assistant director, an engineer, a medical technician, and a secretary. Near the end of the first year another physician was added to the staff, but shortly after the beginning of the second year the assistant director resigned to go into private practice. A second engineer was employed at the beginning of the second year; he resigned after six months, but the position was filled near the end of the biennium by a young engineering graduate. Thus, the Division personnel has varied from five to seven employees during the biennium. At its close there were six persons employed.

The substances and conditions involved in occupational disease investigations during the biennium are:

Molding sand	Lead	Cotton seed oil
Pyrophyllite	Sand paper	Bakers' dermatitis
Granite	Nitrous Oxide	Metal fumes
Clay & shale	Low grade cotton	Gold ore
Talc	Fugitive dyestuff	Carbon monoxide
Mica	Asbestos fibre	Chlorine gas
Feldspar	Textile boiling-out powder	

Summary of Major Accomplishments

Persons examined clinically and radiographically.....	5,885
Blood specimens collected for Wassermann test.....	3,100
Sputum examinations for tubercle bacillus.....	81
Autopsies performed	3
Special clinics held involving compensation litigation.....	8
Compensation hearings at which expert testimony provided.....	6
Major studies (foundry industry, pyrophyllite mining and milling, granite quarrying)	3
Minor studies—miscellaneous industries.....	17
Samples of atmospheric dust analyzed.....	586
Individual plants in which atmospheric dust collected.....	47
Special office studies—research.....	2
Papers, talks, and radio broadcasts presented.....	33
Articles published in national journals.....	2
National and sectional meetings at which papers presented.....	3

ANNUAL REPORT NORTH CAROLINA STATE BOARD OF HEALTH

To

CONJOINT SESSION STATE MEDICAL SOCIETY

**CARL V. REYNOLDS, M.D.,
Secretary and State Health Officer**

May 5, 1937

In this annual report to the Conjoint Session it is my purpose to again deviate from the usual formal report of the activities of the various divisions of the Health Department during the year.

It is deemed wise and appropriate to discuss with you "Syphilis and Its Control in North Carolina."

It is hoped that we may have a free and open discussion in that we may have your constructive criticism and advice before the plan is placed definitely into effect.

Accompanying, and as a part of the North Carolina State Board of Health's Annual Report to the Conjoint Session with the State Medical Society, there is a report of the activities of the various divisions.

The directors, with aid from their efficient and ambitious personnel, have done an outstanding and progressive piece of work, and deserve commendation from us all.

DEPARTMENTAL REPORTS

Division of Preventive Medicine

The Division of Preventive Medicine under the direction of the Assistant State Health Officer, Dr. G. M. Cooper, in addition to the regular routine of editorial work, consultant service in administrative work, etc., has been responsible for the execution of the maternal and child health and crippled children's service of the Board.

MATERNAL AND CHILD HEALTH SERVICE: Since the last report one year ago, working with funds allotted by the United States Children's Bureau, Maternity and Infancy Centers have been established in 42 counties. On April 1, a total of 122 such centers were in operation. With the exception of those in the cities of Charlotte and Fayetteville, and in Robeson County, all represent newly established work. A local physician is in attendance with a special public health nurse. Most of the centers are open one day in a month, but in some the attendance justifies weekly meetings. We have recently been paying out direct to local practicing physicians as honoraria for services in these centers about \$1,200.00 a month.

The admittance is restricted to expectant mothers of the poor. They are given prenatal examination by the physician and the nurse keeps in touch with them until confinement. A Wassermann is done on every

first case as a routine measure. To date, between ten and twelve per cent have been reported positive. A total of nearly 5,000 women have received a medical examination in these centers, and about the same number of babies.

It is a well baby center and advice is confined to problems of feeding and general infant care. When the ante-partum mother or a baby is found in need of medical care, the nurse makes an effort through the welfare officer to have such care provided. It should be a movement, eventually leading to the provision of competent medical service during the prenatal period, at confinement and through the post-partum weeks, for every confinement case.

CRIPPLED CHILDREN'S SERVICE: The work for Crippled Children has been inaugurated also within the past year. Up to April 1, diagnostic and treatment services had been established in 18 clinics. Some of these were old centers which are strengthened financially and some are new enterprises. Nine of the physicians who practice orthopedic surgery exclusively have been cooperating in the conduct of these centers. Twenty-six general hospitals providing a total of 85 beds are now being utilized. A total of about 10,700 crippled children have been located, and by June 30, about one thousand children will have had treatment and hospital care provided.

Division of Oral Hygiene

The outstanding feature of our Mouth Health Program is the recognition it has received throughout the nation during the year now closing.

There is no question in our minds that the reduction of the incidence of degenerative diseases is the next place of attack for Public Health. If this is to be accomplished in a creditable manner, Public Health must take into consideration the mouth as a source of infection. In this phase of Public Health work, North Carolina is a pioneer and the work that we are doing in teaching Mouth Health is, as said before, attracting nation-wide attention.

The Division of Oral Hygiene of the North Carolina State Board of Health conducts, so far as we know, the only program in which Mouth Health teaching is carried into the public schools by trained dentists. We now have on our staff twenty-two school dentists. We also have a puppet show playing in the schools. The dentists go into the schools and teach Mouth Health didactically. They also make the necessary dental corrections for the indigent children and refer those who are able to take care of their own dental needs to dentists in private practice. This is, as you will see, relieving the dentists of an enormous charity practice load. It is reminding many mothers to take their children to their own family dentists, which, of course, is appreciated by the dentists. It is reducing the repeater load in the schools. Most important of all, it is promoting health.

Division of County Health Work

During the last year, full-time local health service has been established in Cherokee, Clay, and Hartnett Counties. Four additional counties have signified their intention of establishing full-time health services by July 1st, namely, Burke and Caldwell in a district service, Hyde in a district service, and Stanly as a county unit. When these services are established, there will be fifty-nine of our one hundred counties provided with full-time health services.

In the fifty-five counties in North Carolina having some type of full-time health service, there are employed at the present forty-eight Health Officers, one hundred and thirty-three Public Health Nurses, seventy Sanitary Inspectors, fifty-five Clerks, six Technicians, five Dentists, eleven other Medical Officers, and four others. A total of thirty-six dental programs are being provided in these health services.

All of the new personnel that has been provided through Social Security funds and increased local appropriations have had special courses of training to qualify them for the positions they are now filling. Within the fiscal year July 1, 1936 to June 30, 1937, there will have been a total of ninety-four persons trained for public health positions, namely, eight Health Officers, eight Sanitary Engineers, fifty-six Public Health Nurses, nineteen Sanitary Officers, and three Laboratory Technicians. All of these will have been placed by July 1st in some sections of our State. This personnel has been trained in the Division of Public Health at the University of North Carolina, George Peabody College for Teachers, the Richmond Division of the William and Mary College, the St. Phillips Division of the Medical College of Virginia, Johns Hopkins University, University of Michigan, and the Maternity Center Association in New York City.

Not all of this personnel has been new personnel. An opportunity has been given for a few to take refresher courses. As time goes on, it is hoped that this opportunity will be granted to more and more of our public health workers in order that we may improve the type of health service being rendered to the people in our State.

Upon the completion of the training courses, all North Carolina trainees are assigned to the field training center which has been designated as the Durham City-County Health Department and the Orange-Person District Health Department. Personnel is assigned to this field training center for a period of one month to acquaint them with the public health practices and laws of the State of North Carolina.

Advisory service to local health units was established during last year. This consultant service has been in full operation since July 1, 1936 and has already demonstrated its usefulness in stimulating increased interest on the part of local health workers, and we believe the type of service being rendered in the local health units through the cooperation of the local workers is nearer what it should be than has been possible for us to accomplish heretofore.

Division of Industrial Hygiene

This division has lent most of its efforts during the past year to the investigation of siliceous dust hazards, these having been decided upon as probably constituting the chief occupational disease problem in the State at this time.

The two physicians and the engineer spent six weeks during May and June in Washington, D. C., attending a seminar on industrial hygiene given by the Division of Industrial Hygiene of the United States Public Health Service. This school was attended by approximately thirty-five engineers and physicians from State boards of health.

After the return from Washington, the department personnel spent some time in organization work, in the planning of activities for the immediate future, in the selection of equipment, and in the preparation of reports.

We have been making a physical and X-ray examination prior to employment and at intervals after employment on each worker in those industries having a siliceous dust hazard. There are approximately two hundred such plants, and to date more than three thousand such examinations have been made. Many of those examined were found to need medical attention of one kind or another, and such cases were urged to consult their local physician. A number of new cases of tuberculosis as well as of asbestosis, silicosis, and pneumoconiosis.

The engineering phase of industrial hygiene is of equal importance to the medical since the solution of the problem of occupational diseases lies in the proper application of engineering methods for the control of the various hazards. This division has on its staff a chemical engineer especially trained and equipped for this type of work. He has made, during the past year, an evaluation of the workroom environment in 8 iron foundries, in the mine and mill of a pyrophyllite producing company, in the carding room of a cotton mill, in 5 rock quarries, and in a newspaper plant. Such studies have resulted in the following accomplishments:

126 dust counts in 8 foundries.

28 dust counts in the mine and mill of a pyrophyllite producing company.

6 dust counts in the carding room of a cotton mill.

70 dust counts in five rock quarries.

5 samples of atmospheric particulate matter collected for lead determination.

Extensive engineering reports were prepared on two foundries. Included were detailed recommendations for exhaust ventilation systems illustrated by mimeographed sketches.

A variety of miscellaneous work has been done and investigations not included in this report have been made by both the medical and the engineering personnel.

Within the next few months we will have collected sufficient data in several of the industries to be able to make specific recommenda-

tions for the control of whatever dust hazard there is. When these recommendations are put into practice they will result in the protection of many workers from the ill effects of dust and complicating tuberculosis.

Division of Epidemiology

Early in the period of time covered in this report the outbreak of vulvo-vaginitis in the schools of Sampson County assumed such proportions that Dr. Otis L. Anderson of the U. S. Public Health Service was assigned to make a study of the situation, assisted by a technician from Rochester University who did the culture work at the State Laboratory of Hygiene. This study, completed the latter part of July, 1936, failed to reveal the gonococcus as the etiological agent. It is felt that perhaps these negative findings were influenced by the fact that the examinations were made during the chronic phase of the vulvo-vaginitis outbreak.

In 1936, two food poisoning outbreaks were investigated by this Division, in June and October respectively. Both were characterized by acute gastrointestinal symptoms (nausea, vomiting, diarrhea) within one to four hours after eating meat products. Symptoms subsided within six or eight hours and patients completely recovered within 48 hours. Laboratory examinations revealed no conclusive findings. Clinical and epidemiological findings suggested staphylococcus food poisoning.

In July, 1936, The Russell Soundex filing system was installed in this office for the handling of tuberculosis report cards. This code system has eliminated, to a great extent, duplication and difficulties in tracing cases for follow-up work. In 1935, before this improvement, 1,996 tuberculosis cases were reported, whereas in 1936 after the system was installed, reported cases increased to 3,008.

In August, 1936, the State Board of Health, in regular meeting adopted a revised form of Rules and Regulations Governing the Control of Communicable Diseases in North Carolina. This bulletin includes all except rules and regulations for the control of the venereal diseases, which are under consideration separately by the Board.

The hookworm survey, begun in North Carolina by the Rockefeller Foundation in cooperation with the State Board of Health and Vanderbilt University Medical School in 1935, was completed in December 1936. Examination of specimens is not complete, but tentative analysis and tabulation of reports received thus far from Vanderbilt indicate that approximately 11.9 per cent of specimens examined have been found positive for hookworm infection, as compared with 29.8 per cent positives revealed by the 1910-1914 Rockefeller Foundation survey in this State.

This Division has begun querying each case of diphtheria reported in an effort to find out if the patient has been previously vaccinated against diphtheria, with the hope of securing information of value in evaluating the efficacy of diphtheria toxoid. Approximately 74 per cent of queries sent out to date have been returned with the desired

information. This is gratifying and quite unusual for routine investigations.

In October, 1936, Dr. G. M. Leiby was employed as Venereal Disease Consultant in this Division to carry on the educational program outlined for venereal disease control. Since his employment he has given illustrated lectures before high school and civic groups throughout the State. In counties with full-time health service he has worked through those departments and in counties without such health service he has appeared under the sponsorship of civic or school groups. Since his employment he has appeared before approximately 27,000 boys and girls of high school age, approximately 10,000 college students, and approximately 13,000 adults.

There was arranged early in 1937, in cooperation with the State Department of Public Instruction, a State-wide series of conferences with high school science teachers for the purpose of integrating basic information on syphilis with the science course already taught in the public schools. Approximately 1,600 teachers have been contacted at these conferences. It is estimated that each teacher represents the contacts of approximately 80 students; therefore, potentially $80 \times 1,600$ or 128,000 students should learn something about syphilis during this school year if teachers grasp the opportunity in their class rooms. About one per cent of science teachers already are doing a good job of presenting the subject. It is felt that as a result of these conferences at least 20 per cent more science teachers will cooperate.

In December, 1936, the Division Director and Venereal Disease Consultant from this office attended the Surgeon General's Conference on Venereal Disease Control in Washington, D. C. Prior to this conference the Division Director was appointed Chairman of the N. C. State Medical Society's Committee on Syphilis Control, and a full report of the Committee's recommendations on procedures and policies relating to syphilis control in this State was presented to the Surgeon General at that Conference.

In January, 1937, Dr. William F. Snow, Consultant with the U. S. Public Health Service, worked with the Division Director for several days revising the rules and regulations governing the control of venereal diseases in this State. It is expected that this revision, now under consideration by the Board members, will be adopted at its next regular meeting.

Of great interest to this Division was the appropriation by the 1937 General Assembly of \$25,000 for each year of the biennium for venereal disease control. It is intended that \$10,000 of this sum shall be used to purchase drugs for treatment of indigent syphilitics, and it is expected that the money will become available July 1st, 1937, at which time this control program probably will be considerably expanded, especially through additional clinic facilities.

Also of importance to this Division was the enactment by the 1937 General Assembly of a law requiring all domestic servants to be examined at least once a year in order to present to their employers certificates showing them to be free of infectious tuberculosis and/or

syphilis. It is felt that this will reveal many syphilis cases now unknown.

Aroused public interest in syphilis control already has reflected itself in greatly improved reporting of syphilis to this Division. In 1936 there was a 20 per cent increase in the number of reported cases of syphilis as compared with 1935. In the first quarter of 1937, 100 per cent more cases were reported than were reported in the corresponding or first quarter of 1936. It is also gratifying to report that of the cases of syphilis reported to this office in 1936, 78 per cent identified the patients by name, making it thus possible to do epidemiological investigations where the physician requested it.

This Division recently has sent to every City, County and District Health Department in the State, a questionnaire designed to obtain certain specific information as to present clinic facilities, particularly with reference to plan of treatment, budget, follow-up work, investigation of source of infection, plan of operation, etc. This information, when secured, probably will form the basis for future plans of this kind for the State.

This Division has just completed sending to all physicians of North Carolina copies of the venereal disease law, the U. S. Public Health Service bulletin "Standard Treatment Procedure in Early Syphilis," and a circular advertising the Public Health Service publication, "Venereal Disease Information," which is considered valuable for reference in this work.

In addition to the specific activities herein reported this Division has carried on the usual routine work of tabulating and recording reports of communicable diseases, making weekly and monthly reports, and handling correspondence.

Division of Sanitary Engineering

In the Division of Sanitary Engineering, the past year has been characterized by a gradual resumption of routine duties following rather feverish activities in cooperation with Federal Relief Agencies.

In the major fields of water works and sewerage, final working drawings have been reviewed, revised, and finally approved for new water works and new sewer systems for the following towns: Morven, Hemp, Fuquay Springs, Candor, and Pilot Mountain. Plans for water works alone have been approved for Mt. Gilead, Whitakers, Yanceyville, and Stanley, and plans for new sewer systems alone have been approved for Burgaw, Mt. Pleasant, West Jefferson, and Benton Heights. Plans for new sewage treatment plants have been approved for Hemp, Greensboro, Mt. Pleasant, and Albemarle, and plans for new water filtration plants have been approved for Spray and Draper. Sewage treatment plant plans for approximately 75 schools and institutions have been approved during the past year, and plans for swimming pools have been approved for Chapel Hill, Winston-Salem, Sylva, Charlotte, Black Mountain, and High Point.

During the past twelve months routine supervision of dairy sanitation has been resumed. Special assistance has been given to 33 retail-

raw dairies by means of plans, drawings, and sketches for remodeling and improving their dairies. Likewise, 20 pasteurizing plants have been assisted by means of plans for remodeling and improving their plants.

The work of the Division of Sanitary Engineering in supervising relief labor, engaged in Community Sanitation and Malaria Drainage Work, has increased materially during the past twelve months over the previous twelve months. A year ago the State Board of Health was able to report the construction of 18,713 privies built during the previous twelve months with Federal Relief labor. This year a total of 32,528 privies have been constructed in North Carolina by means of relief labor. This brings the total number of privies built by Federal Relief labor in North Carolina to over 102,000 to date. This would be enough, if placed side by side, to form a solid line over 116 miles long. It would be equivalent to a solid line of privies from the Virginia line through Winston-Salem and Charlotte, on down about two miles into South Carolina. The cost of the relief labor alone on these sanitary privy projects averages about \$13.00 a privy, while the cost of material averages about \$15.00 a privy. This means that during the year just past over \$900,000 has been put into circulation for wages and material in this work alone. The average number of men employed on Community Sanitation work has been slightly in excess of 900.

MALARIA CONTROL PROGRAM: Between the period May 1, 1936, and April 30, 1937, there has been expended an estimated amount of \$866,000.00 in North Carolina for malaria control drainage projects which are actively supervised by the Malaria Control Section of the State Board of Health. Of this total expenditure some \$706,600.00 has been expended by the Works Progress Administration. The remaining amount was contributed by municipalities and persons locally interested in certain projects and by the U. S. Public Health Service and the State Board of Health. These funds have made it possible to construct more than 600 miles of canals and ditches which have drained off approximately 9,550 acres of swamps, ponds or other breeding places for the Anopheles, or malaria-carrying mosquito. All of this work has been carefully supervised by the five district Supervisors and one Assistant State Director, who are actively engaged in the Malaria Control Section of the State Board of Health.

Work has been carried on in 43 counties, distributed throughout the eastern two-thirds of the State with the heaviest concentration of work of course being in the eastern and southeastern sections, where the problem is greatest. In the report made at this time last year, several of the larger projects were mentioned, particularly the one lying in Rowan and Iredell Counties. This project is still under construction, however, one of the three larger sections has been completed and the vast majority of the heavy work on the other two sections has been done. Likewise the large project located in Forsyth County has been completed and closed. The completion of the Forsyth project will be of vast malaria control benefit to the entire rural area surrounding it. Another relatively large project was started early in the fall of 1936 in Robeson County. When completed it will remove

the principal malaria menace from the town of Red Springs, North Carolina, and a large rural area.

During the past calendar year there has been a marked increase in the number of malaria deaths reported, however, it is very gratifying to notice that in areas surrounding large malaria control projects, there has been a marked decrease in a number of cases.

The work which has been carried on during the year is calculated to have benefited approximately 300,000 persons by removing all or a part of the *Anopheles* mosquito breeding area from near their dwellings.

Great difficulty has been experienced in ascertaining the exact malaria problem in the State since it is not a reportable disease at the present time. It is hoped that in the very near future, North Carolina will follow in the footsteps of other Southern States by making malaria a reportable disease and in this way make it possible to determine more accurately the extent and magnitude of the malaria problem. In this way, we will be able to tell exactly how effective anti-malaria work is and concentrate our efforts in places where it is needed most. At present the only method available for determining the location and extent of the problem is by local inquiry of practicing physicians and by interrogating local druggists and store-keepers who dispense quinine, "chill tonics" and other drugs used in the treatment of malaria.

No interruption is anticipated in the present malaria control program and it is believed it will continue with WPA assistance for some time in the future. A great deal of valuable work has already been done but the problem is still great and much more work is needed.

One of the major activities of this Division has been an intensified hotel and cafe inspection program. This has involved the making of approximately 7,500 hotel and cafe inspections during the past year, largely in cooperation with local sanitarians. This has resulted not only in a marked sanitary improvement of our hotels and cafes, but has been reflected indirectly in improvement in dairy sanitation in those counties where the hotels and cafes formerly used ungraded milk.

One special piece of work undertaken was that of a State-wide school survey attempted largely through the Social Securities Fund in the unorganized counties, and through the cooperation of the county sanitarians in the organized counties. This school survey is not quite completed in the organized counties, but a sufficient amount of work has been done to indicate that while there has been some improvement in school sanitation during the past six years, at the same time our school sanitation in North Carolina is still at a very low ebb.

The recent Legislature has seen fit to impose upon the State Board of Health the further duty of sanitation of our meat markets and abattoirs. This does not in any way involve meat inspection work, which, as heretofore, is left entirely with the Department of Agriculture. In administering this new law, it is hoped to integrate it closely with the hotel and cafe work by not only grading meat markets and

abattoirs from the standpoint of sanitation, but also considering the quality of meat used in the hotels and cafes in the future grading of these food establishments.

Division of Vital Statistics

The health condition of North Carolina for 1936 as indicated by the number of deaths was very satisfactory. Deaths from the majority of the preventable causes, with a few exceptions, continued to show some decrease over last year. The slightly higher total death rate was due principally to the increasing number of deaths from such causes as heart and kidney diseases, cancer, diabetes and other non-infectious conditions.

For the year, the Bureau of Vital Statistics recorded 76,869 births and 35,834 deaths. This represents a birth rate for the year of 22.2 and a death rate of 10.4 per 1,000 population. The birth rate was somewhat lower and the death rate slightly higher than for 1935, but there were 40,000 more births than deaths which would indicate in general a healthy growing population.

There were fewer deaths from typhoid and para-typhoid fever than for any previous year, the total being 76, which represents a rate of 2.2 per 100,000 population. Less than one-half as many deaths were charged to whooping cough as for the year before. 1936 was the fifth consecutive year in which no deaths from smallpox were recorded. Deaths from diphtheria increased from 168 in 1935 to 190 in 1936, and tuberculosis, influenza and pneumonia likewise showed a small increase. Deaths from puerperal causes decreased from 554 to 499 and infant deaths decreased by more than 200.

The routine work of the Bureau has become heavier due to the increased demand for certified copies of birth certificates to be used in connection with Social Security benefits and for verification of date of birth for admission to school, for work permits, and for other uses. In order to do this increased volume of work, it has become necessary to employ through social security funds an additional general clerk.

During the year the Bureau of Vital Statistics in cooperation with the Bureau of the Census began sending notification of birth registration certificates to the parents of all children whose birth was recorded since July 1, 1936. In addition to its value to the parents and to the child, it is hoped that this notification will stimulate birth registration. In order to further improve registration, the Bureau of the Census loaned the services of Dr. H. G. Williams to this Bureau from September through December. Doctor Williams traveled over approximately one-third of the State, interviewing physicians, midwives and undertakers and instructing the local registrars in the performance of their duties, and doing other types of general promotional work.

1936 was the last year of a five year study of maternal mortality. The results of this study are now in the process of being compiled. The Bureau of Vital Statistics wishes to express its appreciation for the physicians' hearty assistance in this valuable study, and at the same time to express the desire that all physicians record their birth

certificates promptly and make as accurate a statement on the death certificate as to the cause of death as possible. Without this prompt and accurate certification, the records of the Bureau can not be of as great value to physicians and to health departments as is otherwise possible.

Division Laboratory of Hygiene

The rapidly increasing volume of work demanded of the State Laboratory of Hygiene has tested the capacity of the Laboratory to the limit. Its major activities have increased more than 60 per cent during the past year while its expenditures are only 25 per cent greater.

Bacteriological examinations have increased approximately 50 per cent. Since the effective control of infectious diseases depends to a considerable extent upon early recognition of potential sources of infection, we have endeavored to encourage Laboratory procedures which would make possible early diagnosis. In the case of typhoid fever we have urged that specimens from suspected patients be sent for blood culture, if the patient is seen in the early stages of the disease by his physician. Reliance should be placed upon agglutination tests only during the latter stages of the disease. In 1936 specimens for blood culture were sent from 96 of the 100 counties.

Of all the procedures intended to aid physicians in making a diagnosis the sero-logical tests for syphilis take first place. More than 140,000 specimens have been received by the Laboratory during the last twelve months. Each of the 100 counties sent specimens. Whenever possible, we have performed the Wassermann Test and the Meinicke Clarification Reaction No. 2 on these specimens. A little more than 16 per cent of the Wassermann Tests were positive and of 36,000 Meinicke Tests 18 per cent were positive. The antigen for the Meinicke Test has been adjusted so as to make it more sensitive than our Wassermann.

The Laboratory has participated in the Second and Third Sero-diagnostic studies conducted by the Advisory Committee of the United States Public Health Service. In the second study both our Wassermann and Meinicke were rated as having specificity of 100 per cent but neither were as sensitive as some of the other tests included in the study. The profession should realize that practically all tests occasionally give falsely positive reactions. In patients having malaria the tendency toward falsely positive reactions is markedly increased. Some tests will give as high as 20 per cent presumably falsely positive reactions in this condition. With the syphilis control program only beginning, the Laboratory is now called upon to examine more than 15,000 specimens per month or at the rate of 180,000 per year. It is readily apparent, therefore, that it will be necessary to develop local laboratory facilities for the sero-diagnostic examinations for syphilis. The Laboratory is arranging for the training of technicians who will not only be capable of making sero-logical tests for syphilis but who will be competent to examine specimens of serum from suspected chancre. Satisfactory specimen containers now make it possible for every physician in the State to have darkfield examinations made at

the Laboratory. If we are to have an effective syphilis control program, we must have adequate facilities for early diagnosis. Positive Darkfield examinations can be secured approximately one month before sero-diagnostic procedures can be expected to give positive reactions. From the standpoint of public health as well as the welfare of the patient the saving of one month in the beginning of treatment is of vital importance.

An increase in the number of municipal water plants and school survey conducted by the Division of Sanitary Engineering and County Health Work have markedly increased the number of samples of water to be examined. A study of the reports of these examinations indicate that while our municipal water supplies are not as safe as they could be, they are vastly superior to our private water supplies. Open wells and unprotected springs are always potentially dangerous. Approximately 80 per cent of all specimens sent from such sources show evidence of contamination. The 20 per cent showing no evidences of contamination are dangerous and the satisfactory reports which we supplied the owners probably created a false sense of security that may be disastrous to the consumers. No specimens should be sent to the Laboratory from a source where there is any visible way in which the water can become contaminated. The Laboratory can be most helpful as an adjunct to sanitary inspection of a water supply, and should be used only to locate hidden or concealed dangers.

The products of the Laboratory continue to be widely used, there being an increasing demand for them. In the case of typhoid vaccine, considerably more was distributed than would be required to immunize 400,000 people. During the year a new contract for arsphenamines was executed with a different manufacturer at a considerable lower price than that which we have been paying. This saving has been passed along to the medical profession. We feel that in the treatment of syphilis the best service which we can render is to bring the price of therapeutic agents as low as possible. The marked increase in the demand for these anti-syphilitic drugs is encouraging evidence that the medical profession is giving increasing assistance in the effort to control this disease.

Last year we reported to you that we were endeavoring to secure a new plant for the State Laboratory of Hygiene, that the General Assembly of 1935 had authorized us to apply for a PWA loan and grant for this purpose, that with the approval of the State Planning Board, the Budget Bureau and the Governor and Council of the State, the State Board of Health prepared and filed this application. It was rated high from the standpoint of social desirability and economic feasibility. When the application reached Washington the PWA legal and financial advisors questioned the validity of any bonds which might be issued under Section 479 of the Public Laws of 1935. Since it seemed imperative that we have a new Laboratory at the earliest possible moment, and feeling that a PWA grant would be available if we could issue valid bonds, the General Assembly of 1937 generously enacted Senate Bill No. 425 authorizing the State Board of Health,

with the approval of the Governor and Council of State to issue \$160,000 in Revenue Bonds which would not pledge in any wise the credit to the State. These bonds would be liquidated out of the receipts of the Laboratory. It is our desire that these receipts come from new activities which would be made possible by the new Laboratory plant rather than by making a charge for any of the services which are now free or by making increases in the charges for services which now produces a cash revenue.

Although there are numerous activities which the proposed new plant could make possible, it has been suggested that a nominal charge would produce the required new revenue from the following products:

- Whooping Cough Vaccine Improved.

- Immune Globulin for Measles.

- Anti-pneumococcus Serum.

- Culture Media.

- Antigens and re-agents.

- Milk examinations.

The activities of our Laboratory are limited entirely to those procedures intended to aid in the control of infectious diseases in man. In this field the Laboratory has endeavored to render as much service as its facilities would permit. If greater opportunities for service are made available, a pledge is solemnly executed that commensurate service will be rendered.

**ANNUAL REPORT NORTH CAROLINA STATE
BOARD OF HEALTH**

To

CONJOINT SESSION STATE MEDICAL SOCIETY

CARL V. REYNOLDS, M.D.,
Secretary and State Health Officer

May 4, 1938

In the annual report of the North Carolina State Board of Health to the Conjoint Session of the State Medical Society on May 6, 1936, the statement was made that, "your State Board of Health has complied with all requirements, and plans have been approved by the proper authorities in Washington, and the money is now in the State treasury, subject to check, for carrying out the projects."

Gentlemen:— It is desired to call to your attention that this was just two years ago and I say to you that things have been happening so fast and furiously that it would take a volume to review for you the accomplishments. In this report we are presenting to you a "bird's-eye view" of the 1937 activities carried on in the various divisions. I desire to call to your attention a few of the outstanding features for the year.

The Zachary Smith Reynolds Foundation Fund

It was on December 18, 1937, and through the goodness of the trustees of the Zachary Smith Reynolds Foundation, Incorporated, that the largest donation to preventive medicine ever made in the South was tendered. A check for \$100,000.00 was turned over to the health officials to aid in the fight against syphilis. This fund is to be used exclusively for a militant campaign in North Carolina against the dread disease and scourge—syphilis—and one of the greatest hazards to mankind's happiness. Long before government began to realize its responsibility in the prevention of disease and the preservation of health of the citizens as a means of bringing about better social and economic conditions and in the promotion of human happiness and prosperity, philanthropists led the way. This magnificent philanthropy for which I express, I am sure, the deep gratitude of the entire population of North Carolina, will bring to the realization one of the fondest dreams of the State Board of Health in that it will enable us to accomplish, in the near future, some of the objectives that have seemed years off.

Time will not permit a discussion here of the debt of gratitude we owe these benefactors, but can never repay, nor can we pay just tribute to medical science for its unselfish, sacrificing, painstaking research that led to the discovery of means for the prevention and cure of disease.

Medical science has developed far in advance of society's willingness or ability to receive all its findings. This is due, in part, to ignorance, indifference—but to a greater extent to inability to meet the expense.

This money which has been made available to our people to be used in connection with other funds allotted to the State Board of Health will first enable us to set-up a very definite program in the war on syphilis. It takes a well-organized, qualified organization, with the enthusiasm and the determination to do a good job; it takes the support and cooperation of our people, and it is a challenge to the medical profession and to the public health workers, dentists and pharmaceutical profession to fight, shoulder to shoulder, in the eradication of this "Destroyer of Mankind."

It is, in the opinion of the members of the State Board of Health, and the staff, that in the expenditure of these funds for syphilis control purposes, the area must be carefully selected wherein a definite need has been shown and adequate cooperation is assured. It is realized that no adequate control program could be established on a State-wide basis but by the concentration of a program in selected areas, it is believed a good demonstration can be accomplished. The program must be adequate to handle the problem in a given community.

The areas tentatively selected embrace approximately one-third of the population of the State and will be operated in eighteen health departments including such cities as may be located in the respective counties.

The LaFollette-Bulwinkle Bill

On Tuesday, February 15, 1938, your Health Officer appeared, along with many other interested witnesses, before a sub-committee of the Committee on Commerce of the United States Senate, in support of the LaFollette-Bulwinkle bill for an adequate appropriation for the Federal Government's participation in the cure and control of syphilis in the United States. Again, he appeared at a hearing on Tuesday, April 12, 1938, before a Sub-Committee of the House, in support of the LaFollette-Bulwinkle bill.

I am happy to bring to you this morning, the information that an appropriation for the sum of \$3,000,000.00 for the fiscal year starting July 1, 1938-'39; the sum of \$5,000,000.00 the second year; \$7,000,000.00 the third year, and a sufficient sum to carry on an adequate program for ten years thereafter, has been passed by the Senate.

The situation in the House, up to the moment, is an appropriation similar to that passed by the Senate and has been acted upon favorably by the Sub-Committee, and it is expected to be acted favorably upon by the House when it reaches the floor.

We have reason to believe that this bill for sums as indicated above will meet the approval of the President.

For your information we would add that State allocations out of this fund will be distributed as has been the funds out of the \$8,000,000.00 appropriated as supplementary aid to the States for public health work.

I firmly believe that this LaFollette-Bulwinkle bill carrying an appropriation as above outlined will be enacted into law and it will enable us to prepare for, and start a syphilis control program in all organized counties within the State of North Carolina during the next fiscal year.

With these sums being made available as supplementary to State, municipal and county funds, it is our duty to society and to our commonwealth to eradicate syphilis, the greatest enemy to man's physical fitness.

The New Laboratory of Hygiene and Laboratory of Hygiene Farm

We are happy to remind you of another dream that is fast coming true. On December 16, 1937, a bond issue for \$160,000.00 for the erection of a new State Laboratory of Hygiene and Laboratory of Hygiene Farm unit, was sold. Plans, specifications and details for a fire-proof Central Laboratory Building, approximately 135 ft. x 50 ft., three stories in height, to be located on Caswell Square in the City of Raleigh, N. C., adjacent to the present offices of the State Board of Health, have been completed. The bids for the actual construction are being temporarily delayed pending a grant from the PWA of \$130,000.00 which will enable us to have a larger and more modern building to meet our fast growing demands.

We have purchased a 280 acre farm five miles west of the City of Raleigh on U. S. Highway No. 1 on which there will be constructed operating buildings, horse and sheep barns, and rabbit and guinea pig houses, at an approximate cost of \$50,000.00. This will enable us to have an accredited laboratory—that is a laboratory which meets the approval of the National Institute of Health for inter-state shipment of biologics. This will increase the department's usefulness many times by making available many additional immunizing and neutralizing agencies used in the prevention of disease and the combating of human suffering throughout our great State of North Carolina.

Maternity and Infancy

I would like to call your particular attention to another activity in our maternity and infancy program. During the last eighteen months 11,500 potential mothers have had the benefit of a careful medical examination which they would have otherwise been deprived of. Wassermann tests have been made on each mother and an average of 12 per cent of those examined were found to be syphilitic. About 10,000 babies have been brought to these centers and received medical examinations during the year. There have been operated 130 clinics located in 43 counties; 165 practicing physicians were participating in this work. This outstanding work, in our opinion, will be the means of eventually eliminating the midwives and of getting all women and babies under the care of competent physicians in the years to come.

County Health Work

In the Division of County Health Work there were in 1933 thirty-six full-time local health departments whereas in 1938 the total number of

counties now provided with full-time local health service is sixty-seven, serving a population of 2,775,116 of the 3,250,000 people within the State. There are employed, at present, in these health departments the following personnel: 60 health officers; 207 public health nurses; 108 sanitary officers; 86 clerks; 14 laboratory technicians; 5 dentists (this does not include the work of the 27 dentists working out of the State Health Department), and 7 other medical officers, making a total of 487 full-time personnel employed. A total of 59 dental programs are being provided in these health services.

War Against Pneumonia

On October 21, 1937, at a quarterly meeting of the State Board of Health held in the offices of the Health Building, a committee was appointed by the President of the Board—Dr. Hubert B. Haywood being Chairman, for the Study of Pneumonia Control in North Carolina. The North Carolina State Board of Health, with the aid of the State Medical Society and the Medical School Faculty of Duke University, sat up a Commission for Pneumonia Control and Study in this State. Through the courtesy of the Duke University Medical School and the cooperation of Dr. Wilburt C. Davison, Dean, and Dr. Frederick M. Hanes, Professor of Medicine, a laboratory course of instruction in Pneumonia typing and other scientific procedure concerned with the treatment of pneumonia, was offered free of charge to technicians of the State and the doctors during the week of January 24-29. On January 28th a symposium and clinic on pneumonia was offered to the physicians in North Carolina and adjacent territory. This symposium was attended by several hundred physicians within the State; 60 technicians throughout the State availed themselves of the opportunity of this course in training and we have now, as a result of this study, sixty qualified pneumonia typists located in various cities, towns and health departments within the State.

It is planned by the North Carolina Pneumonia Commission—by laboratory procedure, lectures, demonstrations and motion picture films, to carry to the profession and to the general public, the advisability of, and the necessity for, the early diagnosis of pneumonia through the typing method in order that the serum indicated could be used at the earliest possible moment, realizing that to be most effective, the serum must be given during the first four days of illness. The results from the serum administered are, therefore, most successful if given at the time of the earliest recognition of symptoms.

It is needless for me to call your attention to the serum treated death rate—to illustrate, in Type 1, 15.7 per cent to non-serum treated death rate, 32.7 per cent. Doctor Haywood says—"the North Carolina State Board of Health and the medical profession of the State have a vital interest in pneumonia control and the reduction of its death rate, and plan to keep step with other progressive States in the fight on this disease which has been designated, "the Great Captain of the Armies of Death."

Realizing that there are in the United States about 100,000 deaths from pneumonia; realizing that in North Carolina last year we had

2,945 (provisional) deaths from pneumonia, all forms, and if you please, 1,800 deaths from Type 1 pneumonia, it kindles in my mind a new dream which is the establishment of a "pneumonia farm" from which we can produce for our citizens in the State of North Carolina, serums for free distribution for at least at a minimum cost which will place it in the hands of the medical profession to be used upon those who need it.

DEPARTMENTAL REPORTS

Division of Preventive Medicine

For the year ending April 1, 1938, this Division is able to report progress along many lines. A brief synopsis of the chief accomplishments of the division work as a whole may be best described by taking up one by one the work in the various departments comprising this Division.

1. **HEALTH EDUCATION.** The most notable achievement in this Division seems to the Director to be the increasing demand for the Health Bulletin. During the year about 7,000 additional names have been added to the mailing list. This, in spite of the fact that special efforts to revise the list and bring it up-to-date have been made. This effort has resulted in the removal of several thousand names which were considered dead on the list. The mailing list today is probably as nearly a "live" list as we have ever had. There has been no special effort at all made to procure names for this list. It comes probably as a result of the material having been published in the Bulletin for the past year being a little above the average in the character of the information imparted. Such, for example, as the Dr. H. A. Royster article in the April issue, and also from the fact that some of the health officers and some of the Children's Bureau nurses have found the Health Bulletin helpful in their work.

There have been several revisals of special pamphlets, and altogether the available literature is better today than it has been for some years.

An important feature of the educational work this year has been the Health Institutes arranged by the State Health Officer and a representative of the State Department of Public Instruction in which a series of Health Institutes for teachers were inaugurated on March 10 and which, of course, extended through the month of April. This plan provided for a series of lectures in 37 different places, representing every section of the State. Doctor Norton and Mrs. Guffy of this department, Miss Thomas of the State College, and Mr. Perry of the Department of Education have borne the brunt of this work. They have performed a very creditable service. It should result in a great deal of good which will probably become more apparent at the opening of schools next fall.

2. **PERSONAL HEALTH SERVICE.** The personal mail service which is a sort of personal hygiene service has been heavier this year, apparently, than in many years. Advice has been given on an average to about 250 people each month from every section of the State. We

have received gratifying evidence from many quarters of the helpfulness of this service.

3. SCHOOL HEALTH SUPERVISION. This work has been somewhat curtailed during the past year on account of the illness of two of the nurses who were stricken about the last of December. A third nurse, Miss Hendrix, was granted a leave of absence beginning the first of January for postgraduate work. A fourth nurse, Miss Beam, was assigned to special duty in Cleveland County on the first of January. Therefore, the usual service in the field of school health supervision has been considerably curtailed. It is safe to say, however, that important service which was greatly needed has been rendered during the year to several county health officers, particularly in strengthening their work for midwife control as well as routine inspection of school children.

4. MATERNAL AND CHILD HEALTH SERVICES. Naturally, the greatest accomplishment and the hardest work has had to be done in the field of Maternal and Child Health Services. Provision for the Maternity and Infancy Health Centers has been expanded and the services increased materially. The work as carried on this year has been done in counties having whole-time health departments, with the exception of Ashe, Alleghany and Polk, which were made special demonstration centers. The work of providing medical examination for expectant mothers among the class of women who have no family physician and who depend on midwives, and also the provision for medical examination at monthly periods or less for the babies of such women has been an important part of the division work for the past year. During the year not less than 10,000 women have had the benefit of a medical examination which would have not received it otherwise. Wassermann tests have been made on everyone of these women and an average of about 12 per cent have been found to be positive. About 10,000 babies have been brought to these Centers and received medical examination during the year. Centers in active operation as of April 1 comprised about 130 in number located in 43 counties. One hundred and sixty-five practicing physicians were participating in this work. A total amount sufficient to pay in full about 45 nurses known as Children's Bureau Nurses was being expended through this department and used to expand the nurse service of whole-time county health department staffs. The success in getting prenatal medical examinations made and in getting the examination of babies made satisfactorily by competent physicians and getting the advice put into practice is dependent upon the ability and industry of the nurses employed and the ability and industry and attitude of the county health officer in charge. The most encouraging reports were received from nearly everywhere with only a few exceptions during the month of March. Properly handled, this work has come to stay, and it will be the means eventually of eliminating the midwife and of getting all the women and babies under the care of competent physicians in the years to come. Naturally, it will take many years to reach such an ideal state, but if competent management and inspiration is forthcoming permanently from this Division, the necessary support from the State at large will sooner or

later be procured. It is an ambitious program and one worthy of the best mettle of every member of the staff from the State Health Officer down.

5. **CRIPPLED CHILDREN'S SERVICE.** We have just completed a two years' experience in the direction of the coordinated Plan of Services for Crippled Children in North Carolina. This two-year period has demonstrated the wisdom of the original features of the Plan. A recent comparison with similar activities among the other States indicates that satisfactory progress has been made in the projection of these services in North Carolina.

Hospital services have been available at the North Carolina Orthopedic Hospital which now has a bed capacity for 160 children with an annual intake of more than 400 individuals. In addition to this facility, a number of general hospitals have been utilized and per diem services for individual children have been purchased through the use of Social Security Funds allotted to the State. During the past year more than 900 children have been authorized for submission to the general hospitals, and very near that number have been admitted and discharged, after having received treatment. Ten qualified orthopedic surgeons are cooperating in the extension of medical services under the Plan, and these conduct the several clinics which are increasingly serving as adjunct to the services set out above. During the same period more than 100 appliances have been purchased in the case of individual children.

There are now 18 clinic centers for crippled children located strategically throughout the State and in reach of every section, as well as the people. There were more than 5,000 children admitted to these during the past period under consideration where diagnostic and treatment services were rendered. Reports indicate that there were more than 500 cast procedures in the case of children, approximately 200 brace measures undertaken, some 300 corrective shoe adjustments, and near 400 corrective exercises advised.

The field staff has held more than 1,000 conferences with health and welfare officials in the process of extending services to indigent cripples throughout the State. There have been more than 200 clinic attendances on the part of these field workers where assistance has been rendered to more than 2,000 individual cripples by these field workers. Report further indicates that there are approximately 400 field visits to the homes of newly located crippled children and approximately 1,000 visits to the homes of old cases of crippled children. Approximately 350 persons have been referred by the field workers to the Department of Vocational Rehabilitation, an Agency concerned with the educational and vocational guidance and training of physically handicapped individuals.

It is apparent that adequate funds are not available to the total needs of crippled children within the State; however, the medical aspects of these needs are being much more adequately met at this time.

Division of County Health Work

During the last year full-time local health service has been extended to fourteen additional counties, namely: Anson, Johnston, Martin, Stanly, Burke, Caldwell, Chowan, Greene, Chatham, Transylvania, Dare, Hyde, Tyrrell, and Washington Counties. The total number of counties now provided with full-time local health service is sixty-seven. In addition, there are six City Health Departments, namely: Asheville, Charlotte, Greensboro, High Point, Rocky Mount, and Winston-Salem. The total number of health units serving these six cities and sixty-seven counties is fifty-five.

There are employed at present in these health departments the following personnel—sixty health officers, two hundred and seven public health nurses, one hundred and eight sanitary officers, eighty-six clerks, fourteen laboratory technicians, five dentists, and seven other medical officers, making a total of four hundred and eighty-seven (487) full-time personnel employed. A total of fifty-nine dental programs are being provided in these health services.

Since July 1, 1937, there have been trained, or are now in training, twelve health officers, forty-six public health nurses, sixteen sanitary officers, three sanitary engineers, and four laboratory technicians, or a total of eighty-one trainees. The training of these persons has been made possible through funds provided from Social Security or the Reynolds Foundation. This personnel has been trained in the Division of Public Health at the University of North Carolina, Johns Hopkins University, Vanderbilt, University of Michigan, University of Minnesota, Richmond Division of the College of William and Mary, and George Peabody College for Teachers, Saint Philips Division of the Medical College of Virginia, Columbia University, and the Maternity Center Association in New York City. All new field personnel have had training in the field of training centers in the Durham City-County Health Department and the Orange-Person-Chatham District Health Department. This training has consisted of at least one month to acquaint them with the public health practices, procedures, and laws of the State of North Carolina.

Consultation service has been rendered to the local health units through the Division of County Health Work in Public Health Administration, Public Health Nursing, Public Health Engineering, and statistical work in developing local public health programs and raising the standard of service performed.

In December, 1937, there was a one-day meeting of all health officers in the State called to meet with the staff of the State Board of Health in Raleigh. This meeting was well attended and it was decided by the health officers present that it would be advantageous to make the meeting an annual affair in the future.

Through the cooperation of the United States Public Health Service, nursing institutes are now being held for all the public health nurses of the State to acquaint them with the public health problems in connection with the Venereal Disease Control Program. These institutes have also been well attended and are serving as a stimulus to the nursing

personnel in handling this particular problem. It is expected that similar institutes will be conducted in the future in connection with specific problems confronting public health nurses.

Division of Epidemiology

The tremendous expansion in venereal disease control work in North Carolina, which is nominally under the supervision of this Division, is undoubtedly the highlight of the year covered by this report. The publicity given this problem was reflected in a vigorous increase in the number of reported cases of syphilis, e.g., during the months of May, June and July, 1937, the reporting of syphilis increased by 177 per cent over the reporting of this disease for the same period of the preceding year. These comparative statistics alone indicated to us the growing interest in this problem and gave promise of more thorough cooperation by the public and the physicians of the State than we had hoped for before.

On July 1, 1937, Dr. G. M. Leiby, Venereal Disease Consultant with this Division, went to Johns Hopkins School of Hygiene to enter upon a course of training in Syphilology for a year. Dr. F. S. Fellows, P. A. Surgeon of the United States Public Health Service, was assigned to North Carolina to act as Venereal Disease Consultant in Doctor Leiby's absence. The greater portion of Doctor Fellows' time has been spent in the field visiting the venereal disease clinics in the State, studying treatment procedures and methods of handling cases in these clinics. The collection of this information was considered necessary before any recommendations could be made for the standardization of our clinic procedure. At the time this report is being made there are one hundred and one venereal disease clinics in North Carolina. An effort is constantly being made to obtain the establishment of new clinics, especially in those counties that do not now offer such facilities to its citizens.

In line with this venereal disease control program a copy of the Committee Report on the Public Health Control of Syphilis, which was prepared at the Conference of State and Territorial Health Officers in April, 1937, was sent to the secretary of each county medical society in North Carolina. It was felt that a careful study and discussion of the plan set out in this Report would promote greater cooperation between the private physicians of the State and Public Health authorities.

During this year a number of forms used in this Division have been revised or designed. Among these were the venereal disease clinic record and the typhoid fever investigation form, both revised to provide more specific information on the case and thus facilitate follow-up work, especially for the clinic record. Also designed was the domestic servant health certificate, which is furnished to the physicians and health officers of the State for use in the examination of servants for active tuberculosis or venereal diseases, as required by law. Two other forms may be mentioned, viz., the "Notice of Failure to Take Treatment for Venereal Disease" and the "Venereal Disease Detention Order." These forms are for the use of the health officer

locally, the first form to be sent to the delinquent syphilitic direct and the second form to be served by the Sheriff of the County. These forms are used quite extensively.

In July, the Entomologist and two Engineers selected to study at the malaria training stations in Georgia, Florida and Alabama preparatory to the establishment of a Malaria Investigation and Control Unit in this Division, entered upon that course of study. In addition, two malaria technicians were given a ten-day course of training at the station in Savannah, Georgia. The personnel of this Unit returned and began active work in the field early in the fall. In the winter months the Director of this Division held conferences with various local health officers relative to beginning a program in their counties. After satisfactory arrangements were completed two counties, Robeson and Edgecombe, were surveyed by the thick smear method and approximately 10,000 slides were taken from those two counties. The Entomologist and Engineer made epidemiological investigations, taking histories and preparing maps of the various areas surveyed which gave essential information on each project.

No notable outbreaks of disease requiring epidemiological investigation occurred during this year. Several smaller outbreaks were investigated, however, including that of cerebrospinal meningitis in Stokes and Yadkin Counties, which did not show any serious development.

During the early part of the winter a supply of drugs for the treatment of syphilis in the various health department clinics was obtained and its distribution begun. This supply of drugs consisted of neoarsphenamine, bismuth subsalicylate in oil, sulphur-sphenamine and sterile distilled water.

In December the State Board of Health was pleased to announce the gift of \$100,000.00 from the Zachary Smith Reynolds Foundation, Inc., of Winston-Salem, N. C., which is to be used exclusively for syphilis control in this State and to be administered through this Division. Following the announcement of this gift various conferences with Trustees of the Foundation and health officials have been held. A plan of allocation of the funds and their administration has been developed and is being presented to those health officers whose departments were selected to participate. The response of these health officials and interested groups of citizens in their communities has been very gratifying. They have readily agreed to the plan whereby the local department must match funds with those allocated from the Smith Reynolds Foundation donation in order to participate.

During the early part of the winter preliminary meetings of the Pneumonia Control Commission of the State Board of Health were held and plans made for a short intensive course in the typing of pneumonia serum, which was held for laboratory technicians of the State at Duke University in January, 1938. Sixty-eight persons registered for this course, eight of whom are physicians (one of these a health officer). It is planned to send a list of these technicians to the secretary of the various county medical societies in the State for the

convenience of the physicians of North Carolina who may have need of this information.

During this year radio talks and many illustrated lectures on venereal disease control have been given throughout the State. The expansion of this program has more than doubled the number of requests for this type of service. Two motion picture films on syphilis have been obtained and are in constant use by the Director of the Division and the Acting Venereal Disease Consultant in illustrated lecture work.

In addition to the activities herein reported this Division has carried on the usual routine of daily, weekly, monthly and yearly reports and tabulations of communicable disease, and the handling of a greatly increased volume of correspondence.

Division of Laboratory Hygiene

For the State Laboratory of Hygiene the most interesting event of the year was the sale of \$160,000.00 worth of Revenue Bonds, authorized by the 1937 General Assembly for the purpose of providing the laboratory with a new plant. This, together with additional funds which may be available to the laboratory, will provide a central building on Caswell Square, adjacent to the present State Board of Health Building. At this central laboratory examinations of specimens from patients will be made and biologics will be standardized, tested for sterility and made ready for distribution.

A laboratory farm has been purchased five miles West of the City of Raleigh on U. S. Highway Nos. 1, 64 and 70. On the farm will be constructed horse barns, operating rooms and small animal houses. Here preliminary preparation of biologics will be carried on. It is hoped that most of the small animals needed by the laboratory can be produced on this farm and that the larger portion of the feeds needed for all animals can be grown here.

This new Laboratory Plant has been desperately needed for several years. It will make possible an extension in the service of the Laboratory. Since the bonds issued are Revenue Bonds, it will be necessary that receipts of the laboratory be increased so that there will be sufficient revenue to retire the bonds. As soon as the new plant is completed new products will be available. In the meantime, it has been suggested that the laboratory make a charge for specimen containers. Since approximately 350,000 of these specimen containers are distributed each year, a charge of from five to ten cents for each container would yield sufficient revenue to provide adequate debt service. It is proposed that the laboratory charge only the actual cost of the specimen container. Since from 25 to 30 per cent of these containers are not used for the purpose of sending specimens to the State Laboratory of Hygiene, there is considerable justification for charging actual cost for them.

One of the most perplexing problems of the laboratory during the past year has been the making of serological tests of specimens sent in to be examined for syphilis. The number of specimens alone seri-

ously overtaxed the facilities of the laboratory. During the year 1937 more than 201,000 specimens were sent for examination. It was necessary to handle these specimens in the same space that was available in 1929, 1930, and 1931, during which period there were less than 75,000 specimens examined per year. To add to the difficulties a shortage of guinea pigs made it difficult to secure a sufficient number to supply the required amount of complement for the Wassermann Test. The price of these animals became so high that for a time the laboratory was spending \$35.00 per day for guinea pigs which were used for this purpose alone. It finally became impossible for the laboratory to secure a sufficient number of guinea pigs. It was, therefore, necessary to discontinue the Wassermann Test as a routine procedure and the Kline Precipitin Test was made the routine test. All specimens now received at the laboratory are first examined by the Kline Method and those specimens giving a positive or doubtful reaction are then subjected to the Wassermann Test. The Kline Test is considerably more sensitive than our Wassermann. In the 1937 serodiagnostic study our Wassermann was positive in only 58.6 per cent of the specimens taken from patients with syphilis, whereas, the Kline Test was positive in 84 per cent of the same specimens.

Physicians are frequently confused when serological tests disagree. Most of these disagreements, however, occur in late or treated syphilis. In primary syphilis we should have Darkfield Examinations of Chancre Serum. Suitable specimen containers for Chancre Serum make possible delayed Darkfield Examinations which are dependable and which are available to every physician within the boundaries of the State. Although the collection of satisfactory specimens of Chancre Serum is a tedious and painstaking procedure, it does not require exceptional skill. Any physician can secure a suitable specimen. In secondary syphilis practically all serological procedure will give positive results in 100 per cent of the specimens. Therefore, most of the disagreements among serological tests will be found in patients who have had some treatment or in late or latent syphilis.

The standards set up by the Advisory Committee of the United States Public Health Service are that acceptable tests be positive in $66\frac{2}{3}$ per cent of the patients with syphilis and that not more than one per cent positive reactions be secured on specimens from normal healthy individuals.

It should be remembered that falsely positive reactions are frequently obtained from patients with other diseases. All tests included in the 1935 serodiagnostic study gave falsely positive reactions in patients with malaria. Some tests gave as high as 20 per cent falsely positive reactions in patients with this disease. Tuberculosis frequently gives positive reactions. Twelve or thirteen tests in the 1935 Study gave positive reactions in persons who had tuberculosis and who presumably did not have syphilis. Falsely positive reactions in this condition varied from 2 to 5 per cent. Numerous other pathological conditions apparently have caused positive reactions in persons who did not have syphilis. The laboratory does not much a diagnosis. It

only supplies evidence which may be helpful to the physician in this procedure.

It is encouraging to note that blood cultures are being used more and more in the diagnosis of typhoid fever. This procedure is one of the most useful laboratory aids to diagnosis. It will be positive in the early stages of the disease when typhoid bacilli are not leaving the host in the feces and urine. A positive blood culture will generally make possible the inauguration of typhoid precautions in time to prevent secondary cases. It is, therefore, urged that suitable specimens from all patients that are suspected of having typhoid fever be submitted to the laboratory for culture.

The work of the laboratory has continued to grow by leaps and bounds. Practically all activities have increased. The only exception to this statement applied to the examination of animal heads for rabies. During 1937 only 1,151 heads were sent to the laboratory for examination. This is a smaller number than has occurred since 1932. Of these only 336 showed evidence of rabies. These data furnish additional evidence that rabies occur in epidemic waves and that we are now approaching the bottom of the wave of incidence. It is probable that this disease will continue to decrease in prevalence for at least another year. If we can judge the future by the past, the year 1940 will witness the beginning of another wave in the cycle of rabies.

At the present the laboratory facilities of the State are inadequate to meet the needs of our public health program. It is highly desirable that competent local laboratories be available. It is our hope that we can encourage the development of local laboratories and that we can assist in improving the quality of their service. It would seem that the demand for laboratory service will always be in excess of our ability to supply it. We should, therefore, use our laboratories intelligently and make every effort to conserve these facilities. If we are to get the best work from our laboratories, we must not send to them specimens, the examination of which can reveal no useful information. In this field of endeavor, as in others, we need quality more than quantity.

Division of Industrial Hygiene

During the past year this division has continued its investigations of the industrial dust problem in the State. This has consisted of both engineering and medical studies in those operations involving a siliceous dust hazard.

The medical phase of the work has been carried on by means of a trailer unit equipped with office space and X-ray. Approximately 3,000 pre-employment, routine, and re-examinations have been made for operations scattered over the State. The examination includes an occupational and medical history, general physical examinations, fluoroscopic examination, and at least a single X-ray film of the chest. The findings in each case were studied carefully to determine the worker's physical fitness for employment in dusty trades, and recommendations were made accordingly to the employer. Where some physical impairment needing medical attention was found, the worker was referred to his doctor.

During the year some 360 samples of atmospheric dust were collected for particle counts and 27 for particle size determination in 28 different operations. A number of samples were also collected for petrographic analyses.

The department has recently issued a lengthy report of a study of the foundry industry in the State, including medical findings on 680 employees and the engineering data representing 157 dust counts in 24 foundries. This report also includes recommendations for controlling the dust in those departments where the concentration is apparently too high. Studies now in progress are the granite quarrying and cutting industry and the pyrophyllite mining and milling industry.

It is gratifying to note that in many dusty operations control measures have already been instituted, and it is hoped that the findings of this department will have some influence on further progress in this direction, which, after all, is the ultimate aim in the control of occupational diseases.

Miscellaneous work of the department has included five radio talks, five papers, two articles for the Health Bulletin, preparation of exhibits for the National Tuberculosis Association meeting, for the State-wide Safety Conference, and for the Board of Health Building.

Division of Oral Hygiene

The Mouth Health Education Program of the Division of Oral Hygiene continues to be one of the most popular of our activities. With the aid of outside appropriations we have been able to do more this year than we have in any previous year. However, the demand for the work is greater than we are able to supply and, for that reason, we will necessarily have to have an increased appropriation to take care of the State's part of the expense. This is necessary to meet the present demands and indications are that there will be more counties desiring this service during the next school year than made applications during the year which is now closing.

As you know the purpose of the Division of Oral Hygiene is to teach the value of a healthy mouth. This is done through didactic and demonstrative teaching.

In our didactic teaching we use visual means of instruction. Little Jack's puppet show is one of the best means that we have found. The puppet show will play to about 150,000 children this year.

In the classrooms, school auditoriums, Parent-Teacher Associations, and Civic Clubs over 3,000 lectures have been delivered by members of the staff to approximately 200,000 children and adults.

One of the greatest accomplishments of the Division of Oral Hygiene this past year is the follow-up educational material which is used by the dentists in their classroom teaching. We would not forget to mention the newspaper releases which are prepared on mimeographed sheets and sent to the schools to be incorporated in their mimeographed school papers. These releases go into the homes of 30,000 families twice a month during the school year. They are proving to be very popular, and the letters of appreciation which we receive are gratifying.

In our demonstrative teaching the necessary dental work is done for the underprivileged children who are under thirteen years of age. This does not reach all of this group by any means, but the services are rendered for as many as funds and time will allow. The value of this work is demonstrating itself in such a manner now that it accounts for the increased demand for the service.

Those who are able to pay for their children's dental work are notified through the United States mail that their children need dental attention and that we suggest that they consult their own dentists. In a school of about four hundred children a check was made the other day. We found that practically fifty per cent of the entire group had visited their own dentists during the year. The school was not made up of wealthy children but of good average North Carolina children.

Concrete evidence of the lasting benefits of mouth health education was furnished by a check-up which was made in one of the counties this year. Some individual blanks were sent back to the county for the school dentist who had worked for these children and filled in these blanks several years ago to re-check the conditions of their mouths and also their school records. In practically every case where the dental corrections had been made and diseased tonsils removed there was decided improvement in the child's physical condition. In most cases those who had had to repeat their grades had not had to repeat any more.

Division of Vital Statistics

The Division of Vital Statistics has registered approximately 118,000 birth, death and stillbirth certificates during 1937. Much routine clerical work is necessarily required to secure the completion or correction of unsatisfactory certificates. All certificates are finally systematically arranged, bound and indexed in such fashion that they may be easily located.

Monthly and annual tabulations are made and the findings published. In order to do this routine work, both interpretive and clerical, the Vital Statistics Division has to handle more than 38,000 letters, cards, blanks, certificates, transcripts to Washington, and special reports each month. Part of this service is made possible through funds which are now being obtained from the Federal Government for registration purposes. Furthermore, the Federal Government supplies us with notification of birth registration certificates and permits their being franked to the parents of every child born in North Carolina upon receipt of a birth certificate. Such blanks are highly prized by the parents and are useful in proving the date and place of birth, and parentage.

As indicated by death registration, North Carolina had less serious illness in 1937 than in 1936. The Division of Vital Statistics recorded 34,100 deaths in 1937 compared to 35,580 in 1936. This represented 9.8 deaths for every 1,000 estimated population in 1937 compared with 10.3 deaths per 1,000 population during 1936. In round numbers there were 1,500 fewer deaths from all causes. Improvement was shown in the number of deaths from measles, whooping cough, diphtheria and pellagra. There were 300 fewer deaths from influenza and 200 less

from tuberculosis; there were 100 fewer maternal deaths, but approximately the same number of infant deaths. However, when the larger number of births is taken into consideration, the infant death rate declined from 68.4 to 64.9 and maternal mortality from 7.0 to 5.4 per 1,000 live births. In 1937 there were 80,644 live births, approximately 4,000 more than for 1936. This is over twice as many births as deaths and would indicate in general a healthy growing population.

The work of the Division of Vital Statistics has increased immensely during the past two years. Especially is this true in respect to the number of certified copies of birth and death certificates and the number of verifications issued. This increase is due in part to the need for establishing age for admission to school and for use in connection with securing Social Security benefits for blind and dependent children, and for the aged.

The Division of Vital Statistics contemplates making more statistical studies and interpretations for the use of the State and local health departments. In order to accomplish this some additional equipment has been obtained and an extra clerk employed.

Division of Sanitary Engineering

Increased interest in health work multiplies the pressure for additional service from the Division of Sanitary Engineering. New and additional water works and sewerage plants increase the work and responsibilities of this division. Similarly, every new swimming pool, pasteurizing plant, oyster shucking house, crabmeat plant, school sewerage plant, or water works makes its original demands for review of plans, often a visit to the site, modification, and final approval of plans for the structure. Thereafter, there is the ever-increasing problem of proper maintenance and operation of the plant. New and enlarged local health departments demand new and enlarged assistance and cooperation.

1. **MILK SANITATION.** During the past year this division supervised and assisted in making over 3,800 inspections of dairies and milk plants. Plans were made, modified, and approved for 74 pasteurizing plants and dairies throughout the State. North Carolina now has 149 Public Health Service Milk Ordinance towns. That is more than any other State in the Union, with the possible exception of Texas. Furthermore, 65 of these towns were now making 90% or more on the sanitary rating of their milk supplies. This represents more honor roll towns than any other State. The per capita consumption of milk increases as the quality of milk improves. Last year the per capita milk consumption increased over 10%.

2. **WATER WORKS AND SEWERAGE.** During the year ending March 31, the major municipal water and sewerage improvements under construction with PWA, WPA, or private financing were as follows:

	No. of Plants or Systems	Approximate Population of Towns Served
Water purification plants.....	7	94,953
New water systems.....	15	12,490
New sewerage systems.....	17	12,720
Sewage treatment plants.....	18	56,137

The total population of the State now served with public water supplies is over one million, according to the 1930 census. This is approximately one-third the population of the State. The population served with public sewerage systems is only a little less than that served with public water supplies. Every new water or sewage treatment plant means additional calls for service, additional assistance with operation problems, additional inspections of plants, and additional personnel to be trained and supervised.

In this connection, two schools were held for the training of operators, superintendents, engineers, and chemists who are in charge of water purification plants and sewage treatment works. Under the direction of Dr. H. G. Baity of the Public Health School, the first Sewage Works Operators' Short School in the southeast was conducted at Chapel Hill this winter. This school was highly successful. The 1938 Water Works School, held at N. C. State College and sponsored by the North Carolina League of Municipalities and this Board, was by far the best Water Works Short School ever conducted, particularly since actual laboratory instruction was given in chemistry and bacteriology. It is felt that through these two schools the State Board of Health is able to afford very valuable training to men in charge of plants, training which could not be supplied in any other way. The Sanitarians' School-Conference, conducted at N. C. State College, was a valuable means of inspiration and training for the local and district sanitarians throughout the State.

3. STREAM POLLUTION. With our increasing population, a still greater increase in the use of water-carried sewerage, and a much greater increase in industrial wastes, the problem of stream pollution is becoming more pressing. Stream pollution in North Carolina is recognized as one of our greatest problems by the National Resource Committee. The coming of pulp and paper mills to North Carolina has created new problems in the Chowan and Roanoke rivers affecting our shellfish industry and damaging or destroying a valuable fishing industry at Plymouth. At least two more large paper companies are known to be interested in establishing similar plants, one in the eastern part and one in the western part of the State. To effectually solve these problems of stream pollution and industrial waste treatment, additional sanitary engineers and laboratory facilities are imperative.

4. COMMUNITY SANITATION. Gratifying progress has been made in community sanitation, with nearly 30,000 privies built during the year, and a total of 130,699 privies constructed since the start of CWA. The quality of work done has greatly improved; the quality score of approximately 72% one year ago has risen to 90.3%. This improvement

is an indication of the increased number of concrete slab type privies built and units painted. At the present time 1,200 WPA workers in 62 counties are building about 2,500 units a month.

5. **MALARIA CONTROL.** The malaria control program for the past year has been conducted in forty counties, affording full or partial protection from the malaria-carrying mosquito to approximately 300,000 people. A total of 261.6 miles of new canals and lateral ditches were constructed, with an average of 1,369 WPA workers, 104 CCC young men, and 30 men furnished by the sponsors. Forty-five miles of major canals were constructed with 9 dredges. The total water surface of swamps, ponds, and canals drained equals 5,073 acres. With the aid of blood slide surveys made by the Division of Epidemiology, the projects were carried out where malaria was found to be most prevalent, and where the largest number of people would be affected.

Ditch lining with concrete and stone, which have not been used in this program before, has been started and new projects are being prepared to cover this type of construction, since it is more permanent. One exhibit ditch lining job has been completed, and several more are to be built to show the public this type of malaria control work.

6. **SCHOOL SANITATION.** The field work on a State-wide survey of school sanitation has been finished. An analysis of this material reveals that although improvement has been made within the last five years, school sanitation in the State is still at a low ebb. It is felt that the lack of adequate instruction in hygiene and sanitation, and the actual lack of proper facilities and satisfactory maintenance and cleaning of these facilities are in some considerable measure responsible for the present incidence of filth disease in the State. Definite steps should be taken to replace the present divided responsibility by centralizing the authority and responsibility for school structures and school sanitation in a manner similar to that which has been so successful with our highway system and our prison system, and with our school system as far as school operation goes. If the responsibility for the sanitation and the physical school plants could be placed with some one board or committee, it is believed the results would be equally successful.

The work of the Division of Sanitary Engineering is quite varied. As more local health units develop, more demands are made on this division for additional routine service. In addition to the need of more men and means to cope with ever-increasing routine duties, there are new problems, such as stream pollution control, industrial waste treatment, and air conditioning that must be met, and must be adequately met. To do this we cannot stand still. We must advance to keep abreast of an ever-changing modern world of sanitary engineering.

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